An Address

ON

THE INVESTIGATION OF THE HIGHER NERVOUS FUNCTIONS.

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BY PROFESSOR I. PAWLOW,

ST. PETERSBURG.

(Adapted into English by C. LOVATT EVANS, D.Sc., *Institute of Physiology, University College, London.)*

THE work of Hitzig and Fritsch in the year 1870 marks an important epoch in the physiology of the central nervous system, and formed the starting point of a great number of important investigations of the functions of the cerebral hemispheres, which have proved most fruitful in their clinical applications. Why was this? To my mind it was because investigators were dealing with pure physiological facts, all of which lay within the scope of experimental investigation.

It is important that emphasis be laid on this fact, which physiologists would do well to take as a guiding principle in their further researches on the functions of the cerebral hemispheres. We are now on the fringe of such advances. Although the work which has been done concerning the so-called motor areas of the cerebral cortex must be regarded by physiologists as a very satisfactory achievement, it remains quite an isolated chapter in the physiology of the cerebral hemispheres. Work on the so-called sensory centres has only so far resulted in general indications of the nature of the problem which calls for solution, and none of us can doubt that the investigation of the chief functions of the cerebrum still presents a vast and almost untouched field for the physiologist. Sooner or later we shall find ourselves compelled to undertake the investigation and analysis of the functions of this part of the central nervous system working as an integrated structure whose total activities seem almost boundless. But up to the present, with the exception of the facts discovered by Fritsch and Hitzig, and some general information concerning the sensory centres, these activities of the brain have been grouped with the so-called psychic phenomena which form the subject-matter of sciences other than physiology. It is chiefly for this reason that the physiology of the higher parts of the central nervous system has not made that progress which might have been desired in view of its deep interest and the breadth of the various problems which it presents. For physiology to borrow knowledge from a science more exact than itself is one thing, but it is quite a different thing for physiology to take information from a subject which it must be admitted has not yet arrived at the condition of an exact science, from a subject whose followers are not yet agreed concerning the general postulates, the general tasks, and the method of investigation which it is best to follow.

The physiologist who proposes to occupy himself with the investigation of the functions of the cerebral hemispheres is therefore faced with a dilemma. Either, on the one hand, he must wait until psychology has developed into a modern exact science, with its province and its place among the other sciences exactly defined—only then could the physiologist apply the teachings of psychology with any profit to his complex undertaking. It is, in any case, difficult to see in what way the conceptions of present-day psychology could be related or brought into line with our knowledge of the material construction of the brain. Or, on the other hand, the physiologist must work out a path for himself quite independent of psychology, and must himself investigate and systematize the fundamental mechanisms of the higher nervous functions—in a word, he must remain a pure physiologist.

To my mind, there can be no question of choice in this dilemma. If we choose the first alternative we should be postponing for an indefinite time the investigation of the most interesting phenomena of the animal organism. Thus, only the second choice lies open to us, and I venture to suggest that at the present time there are real and sufficient reasons for believing that this path is the normal and rational one—that is, that its fruitfulness is assured.

We all know what a wealth of material, and what an insight into the phenomena of the central nervous system, has been rendered to physiology by the study of the primitive function which we denote as reflex action. The conception of the simple reflex has removed much of the mystery from the province of neural phenomena, and has brought many aspects of these phenomena within the scope of direct scientific investigation. These investigations have shown with what regularity the animal organism responds, by means of its central nervous system, to various events occurring in itself and in the surrounding world.

It is now time for physiologists to extend their views of reflex action, and to recognize that the nervous system, besides the primitive function of reproducing innate reflexes, possesses another prime function—namely, the formation of new reflexes. Since in machines constructed by human ingenuity we often have examples of the establishment of new relations of the various parts under certain conditions, it is difficult to deny this capability of adaptation to the central nervous system, that complex regulator of an intricate structural entity.

Although these facts and their explanation on these lines do not introduce anything essentially new in our conception of the central nervous system, yet it is highly desirable that they should be systematically investigated, and constantly kept in view in working in this field. It is a generally recognized property of living matter to adapt itself, or, as I prefer to say, to preserve a condition of equilibrium with the world around it. This is equivalent, in this particular case, to saying that new relations are established under new conditions, to the advantage of the living complex; or again, that the living thing is enabled to respond, by definite and suitable activities, to agencies to which it was formerly indifferent.

This establishment of new paths in the central nervous system as a result of the presentation of new external conditions is most clearly seen in the higher animals; their life is one long story of continual evolution and ingraining of these new connexions. Natural factors which at one time are indifferent for the animal's activities can develop in a very short time into powerful stimuli for the most important vital functions.

With the help of my various collaborators I have studied the feeding of the dog, or the introduction of acid into its mouth, together with the simultaneous application of various external stimuli. In the course of time these stimuli develop into infallible excitants of salivary secretion, and thus become indissolubly connected with the reaction of the animal to food or to the introduction of acid into the mouth. We are here undoubtedly dealing with a response, through the agency of the central nervous system, to a special condition in the outer world—it is in fact a reflex; but it is not a stereotyped reflex, it is one which has been constructed under our observation. If we take the word "reflex" as meaning not merely a response to a stimulus brought about by the intermediation of the central nervous system, but add the conception of the regularity and constancy of the phenomena, then it is only necessary to assume—and such an assumption is quite legitimate and scientific—that the newly developed reflex is no accidental occurrence, but is in accordance with fixed principles, in order to see that the word "reflex" is quite in its place when used in connexion with this phenomenon.

Is there any legitimate obstacle to the acceptance of such new self-constructed reflexes in physiological theory? It seems to me that there can be but one. By deliberate or by involuntary comparison with our own subjective world we may feel inclined, by reason of the fundamental nature and adequacy of the new reaction, to reject a deterministic view of the situation. From our own experiences we may be tempted to imagine that the establishment of such new connexions represents a highly complex process, if not, indeed, the intervention of special forces. But have we the right to do this in the case we are considering? In the lower, as in the higher, animals we have innumerable instances which render it quite clear that the new stimulus for the reflex exerts its action just as directly as did the old one. In our experiments with the new feeding reflex we often observed that when the

accompanying stimulus was a visual one the animal, after the reflex had been fully established, exerted the same grasping movements towards the stimulating visual object as towards the food itself. We have found no evidence of such hypothetical complexity in these cases, but rather the contrary. From the fact that the new reflexes can always be produced in a short time under suitable conditions, we may conclude that their production is a simple and easy matter. The inhibition of the reflexes, however, presents quite a different case, for this represents a highly complex process, and quite a number of stimuli of various kinds continually exert a powerful action on the reflex. So that the complexity of the phenomena which claim our attention does not depend on the complex nature of the newly-formed reflex itself, for this is in essence simple, but rather upon the extraordinary dependence of this reflex on events taking place in the outer world, and also in the organism itself.

We will now pass on to the consideration of the second fundamental mechanism which the higher parts of the central nervous system exhibit. A living animal responds by activity to only particular phenomena of the external world, so that it must analyse these and pick out from them certain special components. The higher an animal is in the zoological scale the greater the number of factors which the world represents for him, and therefore the functions of the animal are conditioned by a proportionally large number of factors. A very lowly creature is itself a single receptor, and also a proportionately simple one. In higher animals, with highly developed nervous systems, an important part of this system is devoted to the task of special receptors, for analysis by physical or chemical mechanisms. Highly specialized and delicate analysis is a fundamental function of the higher parts of the central nervous system. As a result of my experimental work, I propose to regard the analysors as specialized parts of the central nervous system, in each of which we must include the peripheral end-organ of the so-called sense organs, the nerve fibre belonging to it, and its termination in the cells of the cerebral hemispheres. It is better to consider the whole analysor in this way as one structure, since we do not at present know exactly what part the peripheral and central portions respectively play in the analytic process. We do know, however, that the analysis lies in very close relationship to the formation of the new reflexes. The mechanism which is responsible for the origin of the new reflexes can only bring into relation with the functional activity of the organism such physical events as are analysed for it. Conversely, there can be no doubt that any phenomenon of the outer world, however insignificant it may seem, when it has been isolated by the analysors of a given animal, can, and in fact does, become a special stimulus for this or that functional activity on the part of the animal. For this reason the investigation of the new reflexes gives us the fullest possibility for an exact study of the functions of the analysors. But the activity of the analysors in the higher animals is as incessant as is the mechanism by which new reflexes arise, and in the present insufficient state of our knowledge of these activities we can scarcely as yet see how far-reaching these functions are in the life of the animal. Probably at present we often ascribe to metaphysical processes what are really only due to fine and accurate neural analytical mechanisms. There is great need for the systematic investigation of the mode of action of the analysors; we need to be able to determine in a given animal what components its analysors are able to distinguish in the presentations of the external world; we need to know all the qualities of the stimulus, their intensities, their limits, and all their interrelations. At the same time we need to investigate the fundamental laws which are concerned with the process of analysis. Partial destruction of the peripheral or cerebral ends of the analysors can only teach us a little about their detailed activity. And the combined activity of all these various parts must eventually give us a clear insight into the total powers of analysis of sensations of which a given animal is capable.

We have now devoted twelve years of hard work to the investigation of these two fundamental mechanisms—to the investigation of the mechanism of the formation of new reflexes, and the mechanism of the analysors. It is my object now to try to give the outlines of our work as viewed from the standpoint of our most recent results; the review must of necessity be a very rapid one, and I shall only be able to refer with great brevity to those results that in my opinion are the most important.

"CONDITIONAL REFLEXES."

As a preface to this short summary, I may state that I have called these reflexes of recent formation "conditional reflexes," in order to distinguish them from the ordinary reflexes, to which I have given the name "unconditional reflexes." The name "conditional" is merely used in order to denote an important property which these reflexes exhibit—namely, their very great dependence on a multitude of conditions. There are, of course, many other words which might be used in place of these, such, for example, as innate and acquired, or fixed and plastic, or permanent and transitory, and so forth. As already stated, my colleagues and I have almost exclusively used the salivary glands as the object of our studies of the conditional reflex. Our reason for this is briefly that the salivary glands are in direct communication with the outer world, having, therefore, quite simple internal relations, and that they can work alone, and do not represent parts of a complicated system, as is the case with the skeletal muscles.

We may now pass on to the consideration of some of our facts. As already mentioned, a fundamental condition for the formation of a conditional reflex is that whatever indifferent stimulus is chosen for the purpose of the reflex which it is desired to build up is given at the same time as the food or acid is introduced into the mouth. After a few such sittings it will be found that this formerly indifferent stimulus alone is now capable of calling forth a secretion of saliva. The conditional reflex has been formed; the formerly indifferent stimulus has now found a path to the requisite parts of the central nervous system. The reflex arc now has a different afferent neuron.

Conditional reflexes can be formed not merely from indifferent stimuli, but also from a stimulus which is more or less closely connected with some special centre in the brain. A good example of this is seen in the experiments with nocuous stimuli, which in common terminology are called painful stimuli; the usual result of such a stimulus is that the animal does its best to defend itself against the stimulus, and to get away from it if possible, or to attack the source of the painful stimulus. But it is possible without any great trouble to modify this response by systematically accompanying each feeding of the animal (that is to say the stimulation of its feeding centres, for there are as good reasons for the existence of the feeding centres as for that of the respiratory centre) by strong electrical stimuli applied to the skin. We now find that even the strongest electrical stimuli applied to the skin give rise merely to the feeding reaction, that is, to secretion of saliva, and to no symptoms of fright or pain at all. The skin of the dog can now be subjected to cutting, pinching, or burning, and the only result we shall obtain will be the manifestation of what, judging from our own experience, we should call the symptoms of the keenest appetite; the animal follows the experimenter about, licks himself, and saliva flows in abundance. This fact has been demonstrated very frequently to large audiences, and to many of my friends privately, and the result can invariably be obtained. Its significance seems to me to be quite clear, for what other explanation is more appropriate than that the nervous impulse resulting from the stimulus, which formerly went to a particular region of the nervous system, is now directed to a different one? In this way we have been able to divert the impulse from one path to another, according to the conditions, and we cannot avoid the conclusion that this represents one of the most important functions of the highest parts of the central nervous system.

Apparently the same factors are at work when a conditional reflex is formed from any indifferent stimuli. The presence of certain special conditions (the administration simultaneously with the unconditional reflex, or with a previously established conditional reflex) causes the indifferent stimulus, which otherwise would be dispersed in the higher centres, to be directed to a particular focus, and eventually to lay down for itself a path to that part.

The question which now arises is—What conditions will determine the direction of the nervous impulse along special channels? Judging from our results it seems to

be a question of the relative functional power of the various centres or of their degree of irritability. The following case can be explained in this way. We have already shown that it is easy to train a feeding reflex with nocuous skin stimuli as the conditional stimulus. All our efforts have been in vain, however, in the special case where the stimuli have been applied to areas of skin which lie directly over bone—in other words, when we have used nocuous stimuli applied to bone. We have also been unable to make nocuous skin stimuli the conditional stimulus for the reaction of the gland to acid (0.5 per cent. HCl introduced into the mouth at the time of the stimulus), in spite of all efforts. To express the thing somewhat crudely, we may say that the centre connected with the painful stimulation of bone is physiologically stronger than the centres connected with the feeding reflex, and that in like manner the feeding reflex is prepotent as compared with the reaction of the gland to acid. For these and similar reasons we say that the stimulus is directed to the centre which is physiologically the more powerful.

There are many subsidiary conditions which play a part in the formation of conditional reflexes, and of these I wish to call special attention to the particularly advantageous conditions of experiment which obtain when the conditional stimulus slightly precedes, in point of time, the unconditional stimulus (feeding or acid) with whose help the reflex is to be built up. If we try to carry out the experiment by feeding the dog, or introducing acid into its mouth, and then even only five seconds afterwards apply the indifferent stimulus with which we wish to build up the conditional reflex, we shall be introducing a condition which will present a remarkable obstacle to the formation of the reflex. This can be explained in the same way as many other well-known inhibitions; the unconditional stimulus creates a focus in a special centre of the cerebrum, and this results in relative depression of the excitability of other centres of the brain, so that stimuli arriving at those parts are now below the threshold value, or else suffer some block to further propagation to other parts of the cerebrum. It seems that the new stimuli are only efficient and can only effect the proper connexion with other stronger and subsequent stimuli when the centres are in a more or less indifferent condition to begin with.

It is naturally of much importance that the stimuli from which the new reflex is to be worked out shall be rigidly isolated. If, in addition to the stimulus which has been chosen for the experiment in hand, another stimulus regularly obtrudes without the operator perhaps being aware of its existence, and if this extraneous stimulus happens to be absolutely or relatively of greater physiological strength than the intended one, then the reflex will be formed not from the desired stimulus at all, but from the incidental one. It has happened in many cases that at the commencement of an investigation, and sometimes throughout the work, the reflex has been dependent upon some peculiarity of the experimenter, upon some odour or movement (or even, it is thought, a change in the mode of breathing on the part of the operator), which has preceded or accompanied the feeding of the dog or the administration of the acid. It was partly on this account that in some of the experiments made by my colleagues in my old laboratory all applications of stimuli and all observations were carried out by mechanical devices from another room. In our new special laboratory we now obtain complete isolation of the animals not merely from the incidental stimuli which may proceed from the person carrying out the experiment, but also from all sudden and variable stimuli. Lack of time will not allow of the description of the other less important conditions which operate in the formation of conditional reflexes, nor of the description of the numerous types of reflex which we have studied, since we must now go on to the consideration of another important aspect of the physiology of these reflexes.

Inhibition of Conditional Reflexes.

Fully formed conditional reflexes, as already mentioned, exhibit great sensitivity to all sorts of conditions, and on this account they are subject, in circumstances of everyday life, to continual variation, and often, indeed, to complete inhibition. This sensitiveness is, however, of value, since it serves as a useful means of checking our methods in any particular experiment.

Spontaneous Inhibition.

We have devoted a great deal of attention to the inhibitory phenomena which are so often encountered, and our experimental material has led us to recognize three distinct types of inhibition. The first type is that which is seen when the animal becomes drowsy, or when it falls asleep; this is seen as a fading and final vanishing of the conditional reflex, and presents many interesting features.

External Inhibition.

The second kind of inhibition we call also "external inhibition," and it corresponds completely with the process of inhibition which has been so much studied in the spinal reflexes. This mode of inhibition is obtained as a result of the arrival at the higher centres of stimuli, either from without or from other parts of the central nervous system, which give rise to other reflexes. There are also various subtypes which can be distinguished.

Internal Inhibition.

A third highly characteristic and especially interesting form of inhibition is that which we have designated as "internal inhibition." This kind of inhibition is developed as the result of particular relations between the conditional stimulus and the unconditional stimulus, with the help of which the reflex has been prepared. Whenever the conditional stimulus, in a fully formed reflex, is occasionally (or, under certain conditions, regularly) not followed by the particular unconditional stimulus (feeding or acid), it becomes converted into an inhibition. We have investigated several types of such inhibition. Thus, if with the fully developed reflex the conditional stimulus is given alone for a few times without being followed, or, as we say, "confirmed," by the unconditional one, the type of inhibition which results is called "extinction." When in working out a new reflex the unconditional stimulus is only allowed to follow some time (from one half to three minutes) after the conditional stimulus, the intervening inhibition is called "retardation."

Conditional Inhibition.

"Conditional inhibition" is seen when the conditional stimulus is accompanied by some indifferent stimulus, and is then not followed by the unconditional stimulus; and, lastly, "differential inhibition" is seen in the fact that stimuli approaching closely to the conditional stimulus in location or quality, and which are at first effective, gradually lose their efficiency as the reflex is developed. That all these phenomena are in reality due to inhibition can be shown by the fact that under appropriate conditions the inhibition may be removed, and the reflex restored—a phenomenon which we have called "escape" of the conditional reflex (*Loshemmung*). Such an effect can be obtained by giving any stimulus of moderate strength which shall evoke an orienting reaction on the part of the animal, and also by some other stimuli. By the observation of various aspects of this phenomena we have been able to study the relation between different varieties of the same types of inhibition and also to study the differences between different types.

Latent After-effect.

In order to cover all contingencies, it is necessary to reckon with the important phenomena of latent after-effect. Many factors co-operate to influence the duration of this after-effect. We have found that it can vary from a few seconds to several days, according to the stimulus and to the special conditions of each experiment.

Propagation of Nervous Influences in the Cerebrum.

We must now return to the question of the propagation of the nervous impulses in the cerebral hemispheres. In addition to the phenomena of the focussing of an impulse in a particular direction, there are many facts which indicate that an impulse can be more or less dispersed or distributed in all directions. The following may be taken as an example in illustration of this. We have a dog which is evidently a watch dog; that is to say, he has developed the reflex of flying at a strange person—an attacking reflex—and, in addition, he is readily roused. When no person except the one who generally experiments with the dog is in the room the animal is quite quiet, and various conditional reflexes and inhibitions can be worked out with ease with him. But if any strange person

enters the room the dog commences at once to bark violently, and if this person makes threatening gestures, or especially if he strikes the dog, the aggressive reaction reaches its climax. Now if the newcomer takes the place of the experimenter, and remains alone to continue the experiment, a very interesting phenomenon is observed. In spite of the fact that the dog continues to bark angrily, the conditional reflex, contrary to all expectation, not merely does not give less effect than usual, but it gives a much *greater* one; saliva flows in great abundance, and the food is taken with hasty snatchy movements from the hand of the experimenter, the object of the aggressive reflex. Now if the new experimenter remains as still as is possible, only applying the conditional stimulus and the subsequent feeding from time to time, the dog finally ceases to bark, although he follows the person closely with the eye the whole time. Now, strangely enough, it will be found that the conditional stimulus is without any effect as judged by the salivary secretion, and the dog only takes food five to ten seconds after it is offered to him, and this is not eaten with relish. But it is only necessary for the visitor to get up and move about in order to restore the hostile demonstration once more, and with this also the heightened conditional reflex to food.

The mechanism of this reaction is, I think, somewhat as follows: The conditional reflex towards the stranger when brought to its climax by the movements of the man acting as a special stimulus, incites the food reflex also. As its intensity diminishes, the excitatory process is confined to its own special centres in the brain, so that the excitability of the food centres is now lowered. When taken in connexion with analogous experiments on the mutual effect of different feeding reflexes on each other, on the effect of heat and cold reflexes on each other, and with other observations, and also with the fact, known since 1870, that general epileptiform convulsions can be evoked by the stimulation of quite small points in the motor cortex of the cerebrum, these facts make the idea that an impulse can spread very widely in the higher centres quite incontestable. Besides the phenomenon of dispersal of the impulse, we see also the converse phenomenon, the focussing and concentration of the excitatory process as the second phase of the whole process.

The same principle can be conclusively demonstrated with the phenomenon which we have called internal inhibition. Although I have recently published an account of this case in the French language, still it will bear repetition here for the sake of rendering the present account more complete. Suppose that we arrange serially several apparatus for effecting cutaneous stimulation along the hind leg of the dog, and that these stimuli have been worked up as conditional stimuli for the feeding reaction, with the exception of the lowest one of all, which has been differentiated so as to be inactive; with such an arrangement it is easy to show that when the lowest piece of apparatus is put in action the resulting inhibition spreads to all the areas above it, and then fades away in strict sequence, to concentrate itself again at its point of origin.

Physiology of Sleep and Hypnosis.

In the course of the investigations on the conditional reflexes the question of the physiology of sleep and hypnotism has forced itself on our attention. The following unexpected facts can now be demonstrated regularly with all the dogs, although at first they were only obtained occasionally. When the conditional stimulus commences half a minute, or one or more minutes, before the unconditional one, a retardation of the effect is developed, as already mentioned; this latter gets nearer and nearer to the point when the unconditional reflex is introduced. The time which intervenes between the conditional stimulus and the response is occupied by the internal inhibitory process. But this is not all. By degrees the effect quite disappears from the period immediately preceding the unconditional reflex, and experiments show that it only persists during the time when the unconditional stimulus is acting. But finally the effect disappears also from this period, and the conditional reflex becomes quite inactive. At the same time the animal enters into a kind of cataleptic condition; inert to stimuli, the animal assumes a particular pose and thus remains rigid, finally falling into a deep sleep, from which it can only with difficulty be aroused. This curious phenomenon develops with different speeds and attains different degrees of intensity, according to certain conditions. The intensity of the conditional stimulus, the length of time which intervenes between the conditional and unconditional stimuli, and the number of repetitions of the subdued reflex, are all conditions which have an influence on the result. The animals also exhibit considerable individual differences. The phenomenon just described disappears rather quickly when the conditional stimulus is given almost simultaneously with the unconditional—that is, when it precedes it by only three to five seconds. It is difficult to avoid the conclusion that these effects are closely connected with the phenomena of sleep and hypnotism, and we shall have to return to a consideration of them presently when we deal with the experiments in which portions of the cerebral cortex have been removed. In conclusion of the part of this lecture dealing with conditonal reflexes, I would remark that time is for us also a real conditional stimulus, which might be subjected to investigation with regard to differentiation, inhibition, and escape. At all events, I have the certain knowledge that by means of exact experiments on the lines here described the problem of time, which has concerned and still concerns philosophers so much, may be definitely solved.

The Functions of the Analysing Mechanisms.

Now we will briefly review the chief results which we have obtained in our experiments on the functions of the analysing mechanisms. We have attempted to investigate still further those qualities and intensities of stimulus which could be isolated by the analysors of the animal.

As we have accumulated more and more experimental material, it has become increasingly clear that the principles on which the discriminative process works are quite general. When any stimulus is used as a conditional stimulus, extensive and less specialized parts of the discriminating mechanism are at first involved, and it is only later on, after frequent repetition of the conditional reflex, that the conditional stimulus becomes more and more specialized and restricted, so as to correspond finally with a very small part of the analysor. Concerning the degree of sensitiveness and the limits of accuracy of these analysors, we are unfortunately unable to state anything, since the limits were determined in the cases investigated by the incompleteness of the apparatus at our disposal.

We have especially studied those inhibitory processes by the help of which the differentiation of the stimulus is brought about; neighbouring and similar stimuli which at the commencement are as effective as the special conditional stimulus gradually become inoperative as the reflex is worked out. This process of differential inhibition can readily be investigated in the form of inhibitory after-effects—that is, the inhibited condition which lingers in the higher parts of the nervous system after the application of the differentiated inactive stimuli. The higher the grade of the differentiation in any case the more clearly are the inhibitory after-effects seen. A new differentiation gives a more powerful inhibitory effect than one fully worked out. The more strongly the differentiation is worked out the shorter the duration of the inhibitory after-effect. If in the course of one and the same experiment the stimulus which has been rendered inactive by differentiation be repeated several times running, the after-inhibition which it produces is intensified by a sort of summation. The phenomenon of escape from inhibition can also be seen with the differentiated stimulus.

Since we have seen that the higher nervous activities can be regarded as the work of two mechanisms—that of the conditional reflex and that of the analysors—we will now see what are the effects of injury or destruction of those structures which are believed to be concerned in the carrying out of these functions. Only a few examples can be given

The experiments on conditional reflexes with skin stimuli are especially striking. Since at the commencement all conditional reflexes are generalized, it is easy to render mechanical stimuli of each of several large skin areas a conditional stimulus for the feeding reflex. If now certain parts of the frontal lobes of the brain be extirpated in such an animal, it will be found that the conditional reflex cannot now be obtained at all from a particular

and sharply delimited area of skin; in all other parts, however, it can be obtained in the normal manner. It is a fact of some importance, also, that on stimulation of the inactive skin areas one obtains a strong *inhibition* of the effect got by the stimulation of the active areas; and that, further, such stimulation of inactive areas leads very quickly to drowsiness and sleep. The conditional reflexes return again in time, but definite injury to the differentiation persists at these places; the analysis is either less accurate or else it presents certain abnormalities. The following effects are permanent, even for years, at the affected areas; the conditional reflex can only be obtained under complete synchronism of the two stimuli, conditional and unconditional; if the unconditional stimulus be removed ever so little from the conditional, the reflex rapidly vanishes and the animal becomes drowsy. At the neighbouring skin areas the conditional reflex remains quite normal. In this way the phenomenon which is seen in the normal animal, and which appears to me to have such an important connexion with the problems of sleep and hypnosis, is evidently much intensified by the operation of partial extirpation. The skin receptors seem to me to be especially well adapted for the investigation of the functions of the cerebral cortex.

Conditional reflexes can also be obtained from stimuli from the locomotor apparatus—for example, from the joints, when the latter have been differentiated from the skin stimuli. The proof that such differentiation is attained is furnished by the extirpation of parts of the frontal lobes. When one part is extirpated the reflex is obtained from the flexion of the joint, but not from the skin; if a different part be removed, we can get the skin reflex, but not the reflex from the joint.

In one case we extirpated the greater portion of the posterior part of the brain, and the dog lived for several years afterwards in complete health; in the later years it was found easily possible to obtain a conditional reflex from various intensities of illumination, yet we could not succeed in getting a reflex for individual visual objects. It was also possible to obtain conditional reflexes for sound in the same dog, and we could even get a fine differentiation of tones. Yet the auditory discrimination of this dog differed greatly from that of a normal animal. Whereas the normal dog can easily distinguish when the same tones follow each other in a different sequence, this was not attained in the present case, in spite of much trouble, and it seemed to lie outside the range of possibilities for this animal. Thus it appears that the limits of accuracy of the analysors are, to some extent at all events, determined by the cerebral apparatus, and that partial destruction of the central end of the analysors leads quite definitely to some special limitation of the activity of the analysors.

The ideal conditions for the investigation of this question would, it seems to me, be obtained in a case in which we had an animal with such numerous differentiations worked out that the slightest interference with the cerebral cortex would be at once rendered evident by a change in this system of differentiations.

Another of our experiments on ablation of part of the brain is especially interesting. In this dog the anterior half of the brain was taken away and all the reflexes which had been worked out on this animal disappeared. The animal appears to be completely helpless and to have lost all its normal relations with the outer world; it cannot take food which is placed before it, it recognizes no objects, persons, or animals, and when it attempts to walk it encounters every obstacle and gets into all kinds of difficulties. And yet even in such an animal there can be found a link with the normal complicated nervous reactions; we can train it to give that response of the salivary glands which we have called the "water reflex." In a normal dog, when water is poured into the mouth, there is usually no secretion of saliva, or at most a few drops. But, if first of all an irritating substance—for example, a little acid—be introduced into the mouth, the subsequent administration of water will provoke an abundant secretion of saliva.

Apparently the various stimuli which accompany the forcible introduction of acid into the mouth, and which also accompany the reflex secretion which follows upon this, become converted into conditional stimuli for the reaction to acid; as such they would also come into play in the administration of water. This secretion of saliva in response to water has all the characters of a conditional reflex. In the animal which I have just mentioned it is also possible to work out the conditional reflex to water in all its normal details. This result has also been confirmed in another animal in which the centre for smell had been spared, but which in other respects resembled the previous one. In this animal it was possible to train smell reflexes also. These animals, speaking psychologically, were uneducatable idiots when judged by their locomotor systems, but as judged by their salivary apparatus they were rational beings enough.

Conclusions.

As my time is so limited, I will only mention two of the conclusions which may be drawn from the experiments which have just been described. The advantage of using the salivary glands and not the skeletal muscles as indicators of the higher functions of the brain is clear enough. If we judged by the muscles, the important fact that these complicated nervous relations still remain after the extirpation of the anterior half of the brain would be concealed. These experiments deal a severe blow to the psychological classification of subjective states; a psychological explanation here would encounter insuperable obstacles and a quite incomprehensible series of phenomena.

In an animal from which the cerebral hemispheres have been completely removed it is impossible to form any conditional reflexes at all. It appears, therefore, that the cerebrum is the organ for the analysis of sensations, and for the construction of new reflexes and new connexions. It represents that part of the animal organism which is specialized for the purpose of retaining the animal always in a state of equilibrium with the outer world; in other words, it is an organ for direct and appropriate adjustment to the most varied combinations and changes in the phenomena of the surroundings; it is the organ which is above all others necessary for the unimpeded evolution of the organism.

It is perhaps not rash to think that some of the newly-formed conditional reflexes can be transmitted hereditarily and become unconditional thereby.

Finally, I can assert from my own experience that the various facts which have been described here are all of them easily and faithfully reproducible. My colleagues and I, to whom I take this opportunity of expressing my best thanks, have demonstrated these facts in the two courses of lectures on the conditional reflexes which I have given, and they have also been shown at various scientific societies and to many visitors in my laboratory.

During our many years of work we have never been able with advantage to turn to psychological conceptions for help, or to utilize explanations founded on these conceptions. I must confess that formerly, when I have found myself in difficulties, I have, perhaps in my anxiety, turned in some cases to these explanations, as to conceptions which have been long regarded as established. But in the long run I have recognized how badly they have served me. It was when I was in difficulties that I did not perceive the natural sequence of phenomena. Such help as psychology gives consists only in words; the animal has remembered, he has desired, he has thought—in other words, these were merely examples of undetermined thought. The methods for the investigation of the higher nervous functions of animals which arise from psychological conceptions, the extrication from labyrinths, the disproving of certain hypotheses, and so forth, naturally yield a scientific material; but this is merely fragmentary, and teaches us absolutely nothing of the fundamental principles of the higher neural processes, since it needs itself to be first of all analysed and explained. For an exact and continuous scientific investigation of the functions of the higher nerve centres, it is necessary that the fundamental and guiding principles be purely physiological ones. On the groundwork which I have just outlined it will be possible to work. The results in the hands of other investigators will show whether my premises are correct and whether they are sufficient.

Gentlemen, I feel that I can reckon on your sympathy with what I have described to you of my work, since it must all be accounted in general, if not in detail, immeasurably more your work than my own. I have not felt that it was necessary for me to mention the names of

those of you who have worked at the central nervous system, and especially at the complicated relations of the animal to the exterior, and who have stimulated me with observations and conclusions to undertake the detailed study of the subject which I have in hand. In these studies we have always felt to what an extent we were dependent upon the work of others, rather than upon our own initiative.

I desire to express my best thanks to our distinguished president for having given me the opportunity of speaking to such a distinguished gathering of my professional brethren on a subject to which I have devoted a good third of my scientific life; and you, gentlemen, I must also thank for your attention, which I have so long abused.

"STRUMA" AN IMPORTANT FACTOR IN DISEASE OF THE EYES.*

BY T. HARRISON BUTLER, M.D.OXON.,

HONORARY OPETHALMIC SURGEON TO THE COVENTRY AND WARWICKSHIRE AND TO THE WARNEFORD, LEAMINGTON, AND SOUTH WARWICKSHIRE GENERAL HOSPITALS.

THE older school of ophthalmologists recognized "struma" or "scrophula" as an important factor in many ocular affections, but when Koch showed conclusively that struma and tuberculosis were identical the term was more or less dropped and their successors ceased to employ it. The logical sequence of thought would have been—certain affections of the eye were once regarded as strumous; struma is only another name for attenuated tuberculosis, therefore these diseases are due to attenuated tuberculosis. This reasoning, however, failed to arrest the attention of ophthalmic surgeons, and consequently many of them have even now failed to appreciate the fact that attenuated tubercle plays an important rôle in many of the diseases of the eye, diseases as common and simple as phlyctenular conjunctivitis and keratitis. Dr. Koller, of New York, in a paper on recurrent tuberculous choroiditis, says that the prominent part played by tuberculosis in the causation of eye diseases was not recognized until the beginning of the present century. I would go further and say that even to-day the most recent textbooks pay little or no attention to it. Von Michel was the first to point out, many years ago, that about 50 per cent. of all diseases of the uveal tract were tuberculous in nature. His work received little notice, although Sydney Stephenson and Carpenter amply confirmed his views, mainly on clinical grounds. Dr. Windbiel, writing in *Ophthalmology* (vol. vii, 1910, which also contains Koller's paper), says that tuberculosis of the eye is a relatively frequent disease, although up to within two or three years ago it was believed that the eye was immune to the tubercle bacillus. He goes on to state that in his clinic at Amsterdam, New York, about one half of all the eye diseases were due to tuberculosis and occurred chiefly in childhood and middle life. I think this high percentage must have been associated with some peculiar local conditions. Mackay, of Edinburgh, read an interesting paper at the annual meeting of the British Medical Association in Liverpool, 1912, which showed that the activities of the *Bacillus tuberculosis* were responsible for a large number of diseases of the eye. His paper was copiously illustrated by a series of excellent lantern slides, and was founded upon a laborious and painstaking research. Many other prominent ophthalmic surgeons, both in England and abroad, are fully alive to the importance of tubercle, but others are still content to talk of diatheses and dyscrasias, and to them the word "rheumatic" is a veritable shibboleth.

Before considering the various parts of the eye and their liability to affection with tuberculosis it will be well to consider the grounds for regarding this etiology as probable or certain in any case under consideration. The most important diagnostic agent we possess is tuberculin used by subcutaneous injection. I reject Calmette's procedure at once as utterly fallacious and very dangerous. I have myself proved it to be harmful to normal eyes, but were the eye actually infected with tubercle it might quite easily lead to its total loss. It is unnecessary to go further into this question, it is one upon which all ophthalmologists, including the originators of the test, are agreed. Von Pirquet's reaction is far too delicate; it gives a positive answer in about 90 per cent. of all adults and in a high percentage of children. A negative result would be far more valuable than a positive, especially if the test were repeated and remained negative. The subcutaneous test is made by injecting old tuberculin into the subcutaneous tissues between the shoulder-blades or into the arm. The patient should be kept in bed for a few days before the test is made, and his temperature taken four-hourly. I always commence with a dose of 0.001 of a cubic centimetre of Allen and Hanburys' old tuberculin. It is uncommon to get a reaction to this first injection. After three or four days I repeat the injection, giving 0.002 c.cm. If no reaction be noted I give a third injection of 0.004 c.cm. The test is not very delicate. It is uncommon for a reaction to follow the first injection, but this sensitizes the body, and the second or the third injection should cause a reaction in a tuberculous individual. It is not essential to increase the dose. In my last case my new house-surgeon misunderstood my directions and gave three successive doses of 0.001 c.cm. Reaction followed the third dose. It has been suggested that this sensitizing action may allow a normal non-tuberculous individual to react. This is not the case; several of my patients have failed to react, even to the third injection. Reactions are far more common after the third than after the previous injections. There are three kinds of reaction: the local, the general, and the focal. The focal reaction is by far the most important in eye work. I have not paid much attention to the local reaction; it seems to me too capricious in its action. It consists of swelling and redness at the site of injection, and may be the only reaction obtained. At present I disregard it as a sign of tuberculosis. In this I may be wrong. The general reaction consists of a rise of temperature occurring at from twelve to twenty-four hours after the injection, accompanied in some cases by general malaise and headache. I take it to signify that somewhere in the body there is a tuberculous focus. The focal reaction consists of increased injection of the eye, pain, lacrymation, and sometimes in the appearance of definite choroidal tubercles of a transient nature, or of nodules in a case of scleritis. I have also noted alterations in pigmentation in cases of tuberculous choroiditis. Up to the present I have never seen any harm done to the eye by a focal reaction to old tuberculin, and in many instances reaction has heralded a rapid recovery. I regard a focal reaction as an absolute indication of the actual presence of bacilli in the eye. Here again I may be in error. Perhaps it is given by an inflammation due to a tuberculous toxaemia.

The second great indication of ocular tuberculosis is the presence of definite tuberculous deposits elsewhere in the body. The most important are enlarged glands in the neck and abdomen, and tuberculous joints and bone disease. I have never so far detected pulmonary complications or pleural disease. In fact, as Straub points out, the chronic attenuated tuberculosis which causes secondary disease, either definitely bacillary or toxaemic, has immunized the organisms to the bacillus, and so serious tuberculosis is rarely seen.

I attach great importance to a family history of phthisis and other tuberculous affections. I obtain it in the majority of my cases. Finally, the actual appearance of the eye will often lead to a correct diagnosis of tuberculosis when the observer has become accustomed to this class of case.

In this paper I am dealing with struma of the eye, attenuated tuberculosis, but it is often impossible to draw a hard and fast line between this class of case and classical florid tuberculous processes, such as, for example, a tuberculous iritis with massive tubercles in the anterior chamber.

It is often difficult or impossible to differentiate between a definite infection where the eye actually contains bacilli and a tuberculo-toxaemia, and in most cases it is unnecessary to make this distinction.

Phlyctenular Ophthalmia.

I shall now after these general remarks consider in detail some of the common diseases of the eye in which

* A paper read before the Birmingham Branch of the British Medical Association.

struma is frequently, if not always, the exciting cause. The most common is phlyctenular conjunctivitis and keratitis. A careful study of this affection will elicit the fact that it is chiefly found in children of a decidedly strumous habit. At least 70 per cent. of my cases have enlarged glands or a very strong family history of tubercle, many of them have adenoids and enlarged tonsils, and with one exception every case that I have tested with a subcutaneous injection of tuberculin has given a positive reaction. Further, I have treated 5 or 6 cases by one injection of T.R., and in each instance the phlyctenule has disappeared within a couple of days. No local treatment was adopted. Dr. Wall, of Coleshill, speaking at the last meeting of the Birmingham Medical Society, said that in every case in which he had used this method of treatment it had been immediately successful. Phlyctenulae are not examples of tuberculous infection of the eye. They have been repeatedly excised and rigorously searched for bacilli, but they have never been found. We must regard the disease as the result of a tuberculo-toxaemia. This view receives confirmation from the fact that they often appear when old tuberculin is instilled into the conjunctival sac. It seems to me that the question with regard to phlyctenulae is not whether they indicate the existence of a tuberculous lesion elsewhere in the body, but in what proportion of cases this is the case. I have been able to regard a tuberculous etiology as exceedingly probable in 70 per cent. of my cases. Professor Straub, of Amsterdam, thinks that 100 per cent. is nearer the truth. I have had one case, as I mentioned above, in which I failed to get a reaction after three injections of old tuberculin in increasing doses, and I have frequently seen them in the East associated with other infections of the conjunctiva, more especially the Koch-Weeks bacillus. At present I can only say that a child with phlyctenulae, especially recurrent phlyctenulae, is probably strumous. Straub has pointed out that these strumous children have a lower specific gravity than ordinary healthy children. Phlyctenulae are very common in hospital practice, exceedingly rare in private practice—a fact that shows that they are associated with defective hygienic conditions. These views are by no means universally accepted. Bishop Harman, in his book, *The Conjunctiva in Health and Disease*, does not even discuss the question of a tuberculo-toxaemia as the usual cause, and says the word "strumous" should be dropped in this connexion. He scouted the whole idea at the Liverpool Meeting last year. The matter is of prime importance. Thousands of children annually have their sight terribly impaired by the ravages of this form of keratitis. I believe that when England gets a milk supply free from living tubercle bacilli the disease will become very uncommon.

Photophobia in Children.

This is a symptom-complex caused by an increased irritability of the mucous membrane of the nose and of the conjunctiva. It is probably due more to the chronic rhinitis than to the catarrhal conjunctivitis. This condition is first cousin to phlyctenular disease. It is practically in its typical form only found in strumous children, who mostly have thick lips and enlarged cervical glands. Associated with the rhinitis and the catarrhal conjunctivitis we generally find eczema of the upper lip and of the skin over the malar bone. Adenoids and enlarged tonsils are frequently present. When a child is treated as an out-patient the photophobia may continue for months, even though atropine is used. If the child be removed from its unhygienic home conditions, and be taken into the hospital and given spinal douches with cold water every morning, it rapidly improves. Unfortunately it often relapses as soon as it returns home. I have tested a few of these children with tuberculin, and have obtained positive reactions. I regard this form of photophobia in which there are no lesions of the cornea as pathognomonic of struma.

Scleritis.

Scleritis is one of the diseases which probably is almost always caused by the *Bacillus tuberculosis*. A few cases of diffuse scleritis and some of episcleritis are syphilitic in nature, and some are due to a gonococcal metastasis, but tuberculosis is the prime factor. This has been rendered almost certain by the researches of Török, Verhoeff, and others. Stork succeeded in producing experimental scleritis in rabbits by injecting living tubercle bacilli into the ear vein. My own results point most conclusively to the same opinion. In all cases in which I have used the tuberculin test I have obtained a general reaction; in four cases I got a focal reaction after an injection of $\frac{1}{5000}$ mg. of T.R. without any general reaction. Scleritis has been held to be due to a rheumatic diathesis, whatever this may mean, because patients with scleritis are apt to have articular rheumatism. I would suggest that the joint pains are due to a chronic arthritis caused either by actual infection with attenuated tubercle bacilli or to the toxic effect of blood chronically impregnated with the products of some distant tuberculous glands. This question of chronic articular rheumatism, not including osteo-arthritis, would seem to be a useful field of research with tuberculin. Scleritis is apt to be a serious disease. It is very chronic, and when cured recurs with aggravating persistency. Each attack leaves scars in the sclera, which may become ectatic, causing an intercalary staphyloma. The cornea is often implicated with a sclerotising keratitis which is, I believe, a tuberculous process, because I have seen it clear up considerably under the action of tuberculin. The origin of the disease is not generally in the sclera itself but in the ciliary body, where Verhoeff has demonstrated a caseating tuberculosis. Up to the present we have been impotent against the disease; there was no efficient treatment. But now tuberculin therapy gives us a potent weapon with which to combat it; but I would here sound a note of warning. Tuberculin in scleritis is a double-edged weapon, which, if not used with extreme caution, may precipitate the loss of the eye. I have on two occasions been faced with a condition of anaphylaxis. One case was a very severe one of scleritis of both eyes in an old woman. I treated her successfully with T.R. after a preliminary test with T.V., which gave a positive reaction. A severe relapse occurred a year later, and I gave her an injection of $\frac{1}{5000}$ mg. of T.R. The result was a little short of disastrous. Both eyes became intensely inflamed, and a severe and intractable irido-cyclitis commenced. After seven weeks of careful treatment she is now a little better, but I fear that the tuberculin has hastened the total loss of both eyes, which was, perhaps, inevitable from the first. I strongly advise that when scleritis has been cured temporarily by tuberculin and a relapse occurs the second course of tuberculin should begin with very small doses, say $\frac{1}{10000}$ mg., and the patient should be kept in bed until it is certain that the second course will be well tolerated. I have had a second example, but the focal reaction which followed $\frac{1}{5000}$ mg. of T.R. fortunately did no permanent harm, although it made me very anxious for the eye for some time.

Interstitial Keratitis.

In about 70 per cent. of the cases of interstitial keratitis is a manifestation of congenital syphilis, but the remainder of the cases are strumous in nature, and often yield to tuberculin treatment. The tuberculous affection is commonly confined to one sector of the cornea, and is not so liable to affect the whole cornea. It is, however, if untreated, more liable to leave behind a permanent nebula, and this is especially the case when the keratitis is contiguous to and part of a tuberculous scleritis.

Tuberculous Iritis.

I shall say nothing about florid tuberculosis of the conjunctiva, cornea, or iris, nor of miliary tuberculosis of the choroid. These conditions are caused by virulent bacilli, and are well understood. I shall at once pass on to a form of tuberculous iritis which is at present barely recognized. I am quite convinced that a certain proportion of iritides of the so-called "rheumatic" type are really due to tuberculosis. Whether there is a direct infection or a toxaemia I do not know. I may at once say that I am yearly becoming more and more sceptical of the existence of a "rheumatic" or "gouty" iritis. Most of these cases are gonorrhoeal in nature, many are caused by a distant septic focus, a septic mouth, otorrhoea, septic Fallopian tubes, boils, etc., others are caused by auto-intoxication from the alimentary tract, but a few are certainly tuberculous. My experiments with tuberculin have shown me that this is the case, and in two examples which I thought might be "rheumatic" I detected choroidal tubercles.

Cyclitis.

Cyclitis is frequently tuberculous, and I have obtained most encouraging results from tuberculin therapy.

Choroiditis.

I do not intend to say much about this subject because I recently read a paper upon tuberculous disease of the uvea to the Midland Ophthalmological Society, which was published in the *Birmingham Medical Review*, May, 1912. It is not an uncommon affection, and exists in three forms—the acute miliary form generally seen in association with tuberculous meningitis, the solitary form, and the disseminated form. The miliary form does not concern us because it is not a strumous disease—it is not attenuated tubercle, but a highly virulent form. It is, however, interesting to note that Stephenson and Marple have both stated that tubercles are present in a very large number of cases of tuberculous meningitis. Marple suggests that if only the examination be made with sufficient frequency they will be detected in every case. They may be very evanescent, appearing rapidly and disappearing within a few hours. The solitary form may advance steadily to the total loss of the eye, but I believe them to be generally benign. I have so far never seen a case which has not cleared up under tuberculin treatment, leaving a practically undamaged eye. I constantly find scars in the cornea, pigmented patches, which represent all that remains of a past tuberculous process. It is, however, a not infrequent occurrence that a fresh solitary tubercle develops close to an old quiescent one. In children obsolescent tubercle of the macula is not uncommon, and naturally their central vision is very defective. Disseminated choroiditis is more likely to be due to syphilis than to tubercle, but I believe that many cases ascribed to this disease are in reality caused by the tubercle bacillus in an attenuated form—to struma, in fact.

Lacrymal Sac.

The lacrymal sac is frequently affected with tuberculosis, especially in children, and should be extirpated at once.

TREATMENT.

We have in tuberculin a weapon which is of inestimable value in the treatment of struma or attenuated tuberculosis. The small chronic foci which originate the ocular manifestations, and the small deposits in the eye do not generally generate enough tuberculo-toxin to excite the formation of antibodies in the blood. In these cases the injection of tuberculin supplies the absent stimulus, and the circulation becomes flooded with the necessary antibodies, whatever they may be, and so the tendency to repair obtains the necessary advantage over the destructive influences at work in the small focus of disease. If, however, the local focus in the eye be but a part of a widely-spread tuberculosis, I believe that tuberculin is apt to be very harmful. The same is true when a state of anaphylaxis is present. Two cases will illustrate this point. Both were adolescents; both had florid tuberculosis of the iris, with large tuberculous masses in the anterior chamber. The first patient was a healthy lad with no other signs of tuberculous infection and a normal temperature. He failed to react to three increasing doses of old tuberculin, but reacted strongly to a small dose of bovine old tuberculin. After a year's treatment with T.R. he made a complete and absolute recovery. The second case had a similar condition in both eyes, but, in addition, had masses of palpable glands in her abdomen and a hectic temperature. After rest in bed, when the temperature curve had become normal in character, I gave her an injection of $\frac{1}{10000}$ mg. of T.R.; the result was disastrous, and hastened the inevitable total loss of both eyes. Probably—nay, almost certainly—the same thing happens when tuberculin is used in phthisis and other tuberculous affections where the actual tubercles are hidden from us, and it behoves us to be exceedingly cautious how we use such a potent agent for good or evil. If recent legislation leads to the indiscriminate use of tuberculin, the results can only be disastrous both to the patients and to tuberculin therapy.

Up to the present I have only used T.R. I begin with $\frac{1}{2000}$ mg., unless I have special reasons for extreme caution. This dose I repeat once a week, and perhaps, after eight to ten weeks, increase it to $\frac{1}{1000}$ mg. It may, in some cases, be advisable to again increase the dose to $\frac{1}{500}$ mg., but generally I keep to the initial dose. A focal reaction obtained during a course of tuberculin treatment always does harm in eye cases, sometimes great harm. It is necessary to be very patient. Sometimes no improvement may be manifest for weeks or even months. My successful case of tuberculous iritis did not show the slightest sign of improvement for five or six months, and then he began to improve and got quite well.

In conclusion, gentlemen, the fact which I have brought to your notice, that attenuated tuberculous or strumous disease of the eyes is exceedingly common and generally amenable to treatment with tuberculin, should lead to the obvious conclusion that the eye is not likely to be the sole organ affected by attenuated tuberculosis. The presence of chronic rhinitis and of enlarged tonsils and adenoids in children should be regarded as indicating the probability of struma, and doubtless much of the chronic rheumatism so prevalent among us has a similar origin.

ON THE RIGIDITY OF CALCIFIED ARTERIES.

BY A. H. MACCORDICK, M.D.,
DOUGLAS FELLOW IN PATHOLOGY, MCGILL UNIVERSITY, MONTREAL.

(*Communicated by* PROFESSOR ADAMI.)

THE ordinary conception of calcification within the organism wherever it occurs is that it is of a stone-like rigid character, and this whether it occurs in a calcified fibroid of the uterus, a calcified obsolescent tubercle in the apex of a lung, or a calcareous plaque in an artery. A familiar expression is "the pipe-stem radial." Here it is true the calcareous deposit is not in the intima, but in the media, but in support of this view our museums show beautiful pipe-stem arteries, with dense white rings of calcification.

But is this view correct or constantly correct? Are there not data which are difficult to reconcile with such a view? Were the radial artery as rigid during life as we find it sometimes after death, why is it capable of expansion with each heart beat, as is indicated by the pulse tracing; why is it compressible by the finger; or why is it not shattered by the fingers of the numerous students during the clinic or ward round? And in the case of the aorta, if the saucer-like calcareous plates and scales which we find after death exist as such during life, why do we not have formed upon them, much more frequently, parietal thrombi, which, becoming free, cause emboli and gangrene? Why, again, do surgeons experience so little difficulty in ligaturing the arteries in a case of senile gangrene, although on examining the amputated limb later the proximal ends of the severed arteries are rigid and brittle?

As a matter of fact I would lay down as a general rule that arteries are not of a stony rigidity during life. (I shall later on give exceptions to this rule.) During life the calcareous matter in the arterial wall is not present in the form of rigid plates. It is there, but in the state that may be compared with unset mortar.

Let me place before you the following observations:

CASE 1.—C. D., aged 72, was a patient in Dr. Finley's service at the Montreal General Hospital. He had a blood pressure of from 180 to 205 mm. of mercury. The radial arteries were tortuous and could be rolled under the finger. He died somewhat suddenly, and permission for autopsy was obtained immediately. The radial arteries were dissected out within one hour of the patient's death. On removal they were no doubt more resistant than the normal, but they could be compressed and could be bent and curved like a moderately stiff rubber tube. About ten minutes after removal, however, the removed lengths of the vessel were found absolutely rigid, possessing "pipe-stem" characters. They crackled on compression and broke on being bent.

CASE 2.—Was one of senile gangrene of the foot in the service of Dr. Armstrong at the Royal Victoria Hospital, Montreal. Dr. Armstrong amputated at the upper portion of the popliteal space. The artery was much sclerosed, but on being severed bled freely, and was ligatured without difficulty.

The distal portion of the artery from Case 2 was immediately dissected out and disposed of as follows: A small length was allowed to stand in the open air; another was dropped into a one-half per cent. solution of sodium hydrate; another into a similar solution of hydrochloric acid; one into a normal saline, and another into a 20 per

cent. solution of potassium sulphocyanide, which latter paralyses the muscle, and therefore dispenses with any rigidity due to muscular contraction. (These solutions were previously boiled and cooled to drive off any gas.) The following changes were noted:

In about ten minutes the artery exposed to air had become hard and brittle, would crackle on pressure, and break in the thicker areas when bent. After four hours the artery in the alkaline solution was still comparatively soft, could be cut easily with a knife, and could be ligatured without rupture. The length of artery placed in the acid solution had become quite hard, and almost as brittle as that in the open air. The artery in the saline solution presented about equal hardness to that in the acid solution, that in the potassium sylphocyanide was of about the same hardness as that in the hydrochloric acid, showing that the contraction of the muscles had no bearing on the extreme hardening.

The lower 2 or 3 cm. of the popliteal and the upper few cm. of the anterior and posterior tibial arteries were filled with recent clot, but like the parts above were pliable on removal. Below this, however, they were hard and brittle, and, on cutting, the knife encountered hard calcareous deposits, similar to that in the artery exposed to the air. As these tibial arteries were removed immediately after the popliteal, I cannot but conclude that this dense calcification had taken place before amputation.

Other confirmatory observations I owe to Dr. Keenan and to Dr. Gruner of the Royal Victoria Hospital, Montreal. Dr. Keenan, amputating a leg for senile gangrene, took special note of the popliteal artery at operation. He found it thickened and nodular but pliable, being ligatured without difficulty. He slit the amputed portion for a few centimetres and found it to cut easily. One hour later he again observed the artery, and found that it had become quite calcified and brittle.

Dr. Gruner, who did an autopsy immediately after death on a case dying of ruptured iliac aneurysm and extensive aortic atheroma, found the aorta fairly soft and pliable, moving without resistance under the fingers. Within a few hours, however, the specimen presented a very different appearance and feel, there being many rigid calcareous disc-shaped plaques with peripheral ulceration between which were areas of atheromatous degeneration.

I have employed the simile of unset mortar, but apparently this is more than a simile—it is, in fact, an identity. On making inquiries, I find that it is generally accepted by chemists that the process of setting of mortar is one of conversion of calcium hydroxide into calcium carbonate by the absorption of carbon dioxide from the air. Kept under an alkaline solution, or kept in bulk away from the air that contains carbon dioxide, mortar remains unset. I have it on the authority of Professor MacIntosh, of McGill University, Montreal, that a mixture of calcium carbonate and calcium phosphate remains soft so long as it is in an alkaline medium; placed in an acid solution it sets.

To test the matter I have made the following observations:

A. *Experiments with Plain Mixed Mortar.*

1. 200 grams of mortar were mixed with about 50 c.cm. of a 2 per cent. solution of sulphuric acid. A mild reaction took place with slight effervescence and evolution of heat. In about half an hour the mass had become dried, hard, and firmly "set," and remained so for over a week.
2. 200 grams of mortar mixed with 50 c.cm. of a 2 per cent. solution of sodium hydrate remained soft until it became dried out, twenty-four hours later, and then could be rubbed to a powder between the fingers.
3. 200 grams of mortar mixed with plain water, dried and became fairly hard and "set" in twenty-four hours, similar to to the mortar to which no extra water had been added.

B. *Experiments with Mixtures of Calcium Oxide and Calcium Phosphate.*

1. About 10 grams each of calcium oxide and calcium phosphate were mixed to a thin paste with a 2 per cent. solution of sulphuric acid, and became hard and "set" in eight hours.
2. About 10 grams each of calcium oxide and calcium phosphate were mixed to a thin paste with a 2 per cent. solution of sodium hydrate. This dried out in twenty-four hours, but could be rubbed to a powder between the fingers.
3. A mixture of calcium oxide and calcium phosphate was rubbed to a thin paste with the fluid expressed from muscle tissue (acid in reaction). This became firm and set in twelve hours.
4. A similar preparation was made, using plain water. This set in about fourteen hours, but even then was not quite so hard as the one with the muscle juice.
5. A mixture of calcium oxide and calcium phosphate was rubbed to a thin paste with muscle juice, to which was added about one-quarter its volume of acetic acid. This became hard and set in eight hours.
6. A similar preparation was made, making the muscle juice strongly alkaline with sodium hydrate. This dried out after about twenty-four hours, but could then be rubbed to a powder between the fingers.

From these observations it would seem quite evident that these mixtures of calcium oxide and phosphate and also plain mortar "set" more quickly in an acid than in an alkaline medium. Also the more strongly acid the medium the faster they set, because when I added strong acid to the mortar there was a marked reaction, which, of course, is easily explained by the equation $Ca(OH)_2 + H_2SO_4 = CaSO_4 + 2H_2O$, and the preparations became dry and extremely hard in a very few minutes.

Again passing CO_2 through the mortar did not seem to immediately affect it, as I stirred for about fifteen minutes a dish of mortar with a glass tube which was attached by a rubber tube to a CO_2 generator, thus while stirring the gas was bubbling through the mortar. Professor MacIntosh thinks there must be a complete reaction going on similar to that in the magnesium compounds used in flooring preparations.

Now it is worthy of note that in the first place the reaction of the tissues and body fluids during life is alkaline but becomes acid shortly after death. It is deserving of note particularly, in the second place, in connexion with arterial calcification, that the gas which after death replaces the blood within the arteries is largely composed of carbon dioxide.

Without doubt when there are large areas of necrosis appearing in the tissues, there the production of acid is sufficiently abundant to bring about an *intra vitam* setting of the calcareous matter. For instance, it is the experience of the gynaecologist that a calcified fibroid of the uterus may be found of stony hardness even while in the body; so also our own experience is that in a case of senile gangrene the arteries of the necrosed or gangrenous area are of stony hardness, whereas the same arteries higher in their course, where the circulation is still maintained, are soft and pliable and can be ligatured with ease.

In short, the realization of this fact, that in arteries provided with an adequate circulation the calcareous matter, whether it be in the intima or the media, remains unset, is calculated to fully explain the cruces indicated at the beginning of this paper. It is easy to understand now why, after handling pipe-stem radials, there is no thrombosis and gangrene, easy to understand why rigid and tortuous splenic and other mesenteric arteries in the aged arterio-sclerotic do not undergo traumatic rupture. During life they are not rigid. It is easy also to understand the occurrence of extensive so-called atheromatous ulceration of the aorta without thrombosis commonly occurring during life. Those ulcers, in short, and the saucer-like plaques with surrounding rupture of the endothelium are *post-mortem* productions. The calcified areas become in the intima set and rigid before the muscular contraction of the aorta gives way and the tube undergoes dilatation. The result is that a tension upon the endothelium at the edges of the plaque induces rupture of this lining.

THE Report of the Inspector-General of the Insane for 1911 states that there were 844 persons certified as insane in Western Australia on December 31st, 1911, an increase of 55 from December, 1910. The total population of the State on December 31st, 1911, was 294,133 (males, 168,260; females, 125,873). The number of admissions to the Government hospitals for the insane was 215 (males, 135; females, 80), and the proportion of admissions to population was 1 to 1,368, or 7.30 per 10,000. The readmissions only numbered 22, or 10.23 of the total admissions, which is gratifying. The number of patients discharged was 99, of whom 78 were discharged recovered; the proportion of recoveries to admissions was 36.27 per cent. During the year 66 patients died; of the deaths, 21, or 31.84 per cent., were due to general paralysis. There were only 4 deaths from phthisis. In connexion with the hospitals at Claremont and Whitby, farms are worked, which, besides affording occupation for the patients, are a source of revenue.

A SECOND CASE OF DOUBLE LOOP HERNIA.

BY

JOHN A. C. MACEWEN, M.B., C.M., B.Sc., F.R.F.P.S.,

ASSISTANT SURGEON, GLASGOW ROYAL INFIRMARY; SURGEON, ELDER HOSPITAL, GOVAN; SENIOR ASSISTANT REGIUS PROFESSOR OF SURGERY, GLASGOW.

IN the BRITISH MEDICAL JOURNAL of April 2nd, 1910 (p. 799), I reported a very unusual form of double loop hernia, and discussed the theories in connexion with the formation of that uncommon condition.

On September 1st, 1913, a man aged 26, suffering from a large strangulated right inguinal hernia, was admitted to the Royal Infirmary under my care (while acting for Mr. Paterson).

He stated that the hernia had been present for at least four years, his work, to which he attributed the affection, having entailed heavy lifting; that it had been gradually increasing in size but had always been easily reducible, and had caused so little trouble that he had never worn a truss. On the morning in question the hernia came down, and was larger than at any previous time. He could not reduce it, and walking was rendered difficult. The strain of subsequent vomiting made matters still worse. The bowels had always been quite regular, and had moved shortly before strangulation occurred.

The hernia was moderately large and tense, and presented a marked prominence in the inguinal region, projecting abruptly almost opposite the position of the internal ring.

On incision the mass was found to consist of two loops of bowel, each some 4 or 5 in. in length, which were prevented from returning by a constriction at the internal ring. This constriction was neither very firm nor tight, and it was possible to pass the finger up between it and the bowel. Had a single loop of bowel been present reduction without cutting would probably have been easily accomplished, but under the circumstances it was necessary to cut the band to enable the middle connecting abdominal loop to be brought down for inspection.

The two herniated portions were bound together by numerous fine translucent bands, which were certainly not of recent origin, and when, after manipulation, the abdominal loop (which was some 8 or 9 in. in length) was brought into view, it was found that these fine bands ran up from the herniated loops to it. The arrangement of the herniated and abdominal loops resembled the Greek capital letter omega, and the fine adhesions running from the herniated to the abdominal loop involved the mesentery of the abdominal loop. All three loops of bowel were dark in colour, congested, and distended. The fine adhesions were broken down, camphorated oil was applied with a view to hindering recurrence, the bowel was replaced, and the radical cure performed. Save for an unusual complaint of pain over the region for a couple of days after operation, the patient made a normal recovery.

In addition to referring to some of the theories put forward to explain the formation of "W herniae," I mentioned in my previous article suggestions made and experiments done to elucidate the reason why the intermediate abdominal loop should suffer so markedly in strangulation of the herniated loops. It appears to me that the fine adhesions found in this case would at least partly explain the implication of the abdominal loop. Traction upon these bands (which, it must be remembered, are abnormal, and would, therefore, not be present in the experimental production of such hernias in animals) rendered them tense, and, attached as they were to the mesentery, must have caused them to drag upon and compress the mesenteric vessels, and thereby interfere with the blood supply of the abdominal loop.

THE Legislative Council of the Federated Malay States has voted £5,000 towards Mr. Chamberlain's appeal for the endowment of the London School of Tropical Medicine. The fund now amounts to £70,000.

A PHYSICIAN practising in Brest, Dr. Lenoble, has detected the presence of a very definite, yet always transitory type of paralysis of the lower extremities, in two families of Breton peasants. A father and two sons were attacked suddenly when working in the fields, and two brothers and a first cousin of the other family suffered in precisely the same manner. All recovered speedily. Lenoble is of opinion that these pareses, which are accompanied by trophic disturbances, are to be traced to a lesion in the anterior cornua of the grey matter of the cord, with implication of the roots of the nerve supplying the vasti, extensor communis digitorum, and extensor proprius hallucis, a very localized anterior myelitis of undetermined origin. The report of these cases was communicated to the Académie de Médecine, Paris, by M. Achard.

THE SCIENCE COMMITTEE OF THE British Medical Association.

REPORT TO THE THERAPEUTIC SUBCOMMITTEE.

PART II.—ON CERTAIN NON-OFFICIAL FATS AS OINTMENT BASES.

BY

ROBERT B. WILD, M.D., M.Sc., F.R.C.P.,

PROFESSOR OF MATERIA MEDICA AND THERAPEUTICS IN THE UNIVERSITY OF MANCHESTER; HONORARY PHYSICIAN TO THE MANCHESTER AND SALFORD HOSPITAL FOR SKIN DISEASES AND TO THE CHRISTIE HOSPITAL.

IN Part I of this report[1] the formulae of the official ointments were considered with especial reference to their bases, and certain suggestions made with a view to modification in those cases where experience had shown the present formula to be unsuitable.

In this part it is proposed to report upon a certain number of non-official fats which have been examined during the past two years in the laboratory and, when found suitable, made into ointments and tried in actual practice.

Various combinations were made, and also mixtures with paraffins and other bases, in order to modify their consistency or other properties. The ointments thus made were compared with the official formulae, and it may be shortly stated that none of those hitherto examined have shown sufficiently valuable properties to justify their inclusion in the *Pharmacopoeia* as general substitutes for the bases already official. Some of them, however, have been found to possess special properties which render them useful for particular purposes.

The soft bases in the *Pharmacopoeia* are wool fat, lard, soft paraffin, almond oil, and olive oil; the hardening substances are beeswax, suet, spermaceti, and hard paraffin. All the official ointments are made from these, either alone or in combination. Their properties as bases have been dealt with in Part I; the substances which have been tried as possible substitutes are butter fat, margarine, marrow fat, goose fat, turtle fat, cocoanut oil, nucoline, cocos white, palm oil, and, as hardening agents, carnauba or Brazil wax, and ceresin.

Butter Fat.

Butter fat has been used from a very early period as an extemporaneous base; the presence of a certain amount of water (12 to 15 per cent.) makes it a pleasant, cooling application, somewhat of the character of a cold cream, but this water also hastens its decomposition and impairs its keeping properties. The presence of about 7 per cent. of the glycerine esters of the more volatile fatty acids—butyric, caproic, capric, and caprylic—also lowers its stability. The melting-point is low—from 31° C. to 34° C.—but, in spite of this, ointments made from it are of good body and rub well.

Margarine.

Margarine in commercial samples resembles butter in its properties. It usually contains only a small amount—usually under 1 per cent.—of the butyric group of fats, and seems to be of somewhat firmer consistence than butter when made into ointments. Probably a very satisfactory ointment base could be obtained by selecting certain portions of the margarine, but the result would not have any advantage over lard, and it is doubtful if it would be any less expensive.

Marrow Fat.

Marrow fat is a cream-coloured solid fat of granular consistence. It rubs smoothly, however, on the skin, and is not sticky or oily; it has a slightly beefy smell. The melting-point was 45° C. to 48° C.; it was not easily

absorbed, only 7 to 10 per cent. after two minutes' rubbing in the manner described in Part I. Ointments made with it were firm and of good consistence; they were slightly granular, but rubbed well.

Goose Fat.

Goose fat, commonly called "goose grease," and frequently used in domestic medicine, is a soft fat varying in colour from white to yellow in different samples. It is much softer than lard and more translucent. It has an unpleasant, slightly rancid smell, which becomes worse on keeping. It rubs easily on the skin, melts quickly, and is not sticky. The melting-point varies, but is about 29° C. It is readily absorbed to the extent of 12 per cent. to 20 per cent. after two minutes' rubbing. When old, the amount of free fatty acids which it contains is sufficient to irritate and redden the skin. This counter-irritant action is no doubt of value for some of the purposes for which it is used. Ointments made from goose fat were of good body, rubbed well, and were more adhesive than marrow fat or lard.

Turtle Oil.

Turtle oil is a dark yellow granular fat, still softer than goose fat and more oily; it has an unpleasant fishy smell, and a melting-point of 27.5° C. It was not absorbed as well as goose fat, but only to the extent of 7.5 per cent. Ointments made from it had much the same properties as those made from goose fat.

On comparison with lard none of these substances appeared to have any advantages over it as a base for ointments.

Cocoanut Oil.

Cocoanut oil is a white, firm, solid fat, slightly granular in some samples. It has a pleasant cocoanut smell, which does not become rancid on keeping. When rubbed into the skin it liquefies at once to an oil, which runs freely and spreads widely on the skin; it has little or no adhesive power. Although a solid, the melting-point is very low—it varied from 22° C. to 28° C. in different samples. It is absorbed to the extent of from 10 to 15 per cent. after two minutes' rubbing.

Ointments made from it have a firm consistence, but melt and run too much for ordinary purposes. It was found, however, particularly useful for ointments intended to be applied to hairy parts, such as the scalp. Here its oily character enables it to penetrate well, and as it has no tendency to cake on the skin it is much pleasanter for the patient in continued use. The addition of a small proportion of wool fat—from 10 to 25 per cent.—gives it some adhesive power and lessens its tendency to run. It does not take up a large quantity of insoluble powders, such as zinc oxide, as well as lard or soft paraffin, and such ointments harden on keeping.

Nucoline.

Nucoline is a white solid fat, firmer but less granular than cocoanut oil; it has no smell. It melts at once when rubbed into the skin, and runs freely. The melting-point was 25° to 26° C., and 15 per cent. was absorbed on rubbing. It has the properties of the cocoanut oil and the advantage of a more uniform consistence.

Ointments made from it resemble those made from cocoanut oil; they are stiff, but on rubbing liquefy and run freely—they also harden on keeping.

Cocos White.

Cocos white is a slightly cream-coloured solid fat, firmer than nucoline and too stiff to rub into a tender skin. When rubbed it melts easily, runs freely and is not sticky. The melting-point was found to be 27° to 28° C., and it was absorbed to the extent of 15 per cent. As a stiffening agent for soft paraffin it gave a very satisfactory ointment in the proportion of 50 per cent.; on keeping this became slightly granular but rubbed easily; in consistence it resembled butter and was neither sticky nor ran on the skin. On keeping an ointment made from cocos white and zinc oxide a very hard mass was formed which required vigorous rubbing to soften it sufficiently for application to the skin when in a tender condition.

Palm Oil.

Palm oil is a bright orange-coloured, pasty, opaque fat obtained from the pericarp of the fruit of the *Elocis guineensis*. The colour becomes paler on keeping and it can be bleached by heating to a temperature of 240° C. The melting-point was found to vary from 30° C. to 35° C. in the samples we had at our disposal, but 27° C. is given in the *National Dispensatory* (1905), with the statement that it may acquire a rancid odour on keeping and the melting-point rise to 42° C.

It has a firmer consistence than lard, but melts easily when rubbed on to the skin, it does not, however, run so much as cocoanut oil. It was found to be absorbed to the extent of from 5 to 7 per cent. only. Ointments made with it were very granular and dry-looking, they rubbed down well with a little pressure and did not run like cocoanut oil, they became harder on keeping.

Carnauba Wax.

Carnauba wax or Brazil wax is a creamy-coloured solid wax; it is very dry and hard, breaking with a resinous fracture; the melting-point is very high, namely, 85° C. It is a vegetable product obtained from the leaves of *Corypha cerifera*.

Earth Wax (Ceresin).

Ceresin or earth-wax is a mineral wax obtained from ozokerite; it is a white, hard solid, with a slightly glistening surface; the melting-point appears to vary, some samples melt at 43.5° C., whereas it is given at 68° C. by some authorities.

Both these substances can be used as stiffening agents in place of hard paraffin and have advantages for certain purposes, these need not be discussed here as they may be found in Franklin's paper in the *Yearbook of Pharmacy* (1909).

PART III.—ON SOFT PARAFFIN AS AN OINTMENT BASIS.

In the first part of this report I called attention to the variable characters of the commercial soft paraffins and suggested the introduction of two varieties, of higher and lower melting points respectively, into the *Pharmacopoeia*. During the last two years I have had samples of soft paraffins supplied to me of firmer consistence and melting-points as high as 46° C. Some of these are admirable bases for protective ointments and much superior to the average article supplied when "soft paraffin" is ordered; if they can be supplied at a cost not prohibitive they will largely fill the place of the present unsatisfactory paraffin ointment, but not entirely, as a still firmer base is frequently required, especially for ointments to be spread on lint and confined in their action to the affected parts.

It has therefore seemed desirable to endeavour to prepare such a base as an alternative to the Lasser's paste, which is too heavily charged with dry powders for some purposes, though admirably suited for others. The base must not be too stiff, as it is frequently applied to a painful or tender surface, and must not require much pressure in order to rub it into the affected part before it melts; on the other hand it must not melt too quickly and run widely over the skin, or its action cannot be confined to the diseased area.

A number of samples of unguentum paraffini were obtained from different sources and examined, others were made in the laboratory by various methods. Samples of hard and soft paraffin of various melting-points were also combined in different proportions and by different methods. These were examined when freshly made and at intervals afterwards during the last twelve months to test their stability. Some were found to be too soft, others too hard; some were granular and did not rub smoothly, others were satisfactory when freshly made but became granular on keeping. Films of these ointments were made on an ordinary glass slide and examined microscopically with a power of 300 diameters. The soft parraffins of low melting-point were practically homogeneous; those of higher melting-point showed usually a few fine prismatic or needle-shaped crystalline bodies, and the official paraffin ointments of 30 per cent. hard and 70 per cent. soft paraffin showed numerous feathery or

rosette groups of these crystalline bodies and also particles of hard paraffin embedded in the softer matrix; probably these particles cause the granular character and consequent want of smoothness on rubbing into the skin which is the main disadvantage of the official formula.

A series of ointments was then made by carefully melting together a soft paraffin melting at 38° C. and a hard paraffin melting at 55° C. and allowing it to cool very slowly with constant stirring.

These preparations were examined microscopically; it was found that while the soft paraffin was homogeneous, a mixture of 95 per cent. of the soft with 5 per cent. of the hard showed a few needle-shaped crystals. This mixture was translucent, smooth and not granular; it had a melting-point of 42° C. A mixture of 90 per cent. of soft with 10 per cent. of hard was somewhat more opaque but still smooth; it had a melting-point of 43° C. and microscopically showed more needles and also a few feathery groups of crystals. A mixture of 85 per cent. of soft and 15 per cent. of hard was distinctly opaque but still smooth to rub; it had a melting-point of 45° C. Microscopically it was more granular and the crystalline bodies more numerous; there were no particles of hard paraffin.

Above this proportion of hard paraffin the smoothness of the ointment steadily deteriorated, and with the official proportions of 30 per cent. hard to 70 per cent. soft a granular ointment was obtained too hard to rub smoothly without considerable pressure. Microscopically it showed numbers of feathery crystals and particles of hard paraffin which had separated out on cooling. This ointment was distinctly worse after keeping than when freshly made, and also worse if allowed to cool quickly and not constantly stirred while cooling.

Similar trials were made with beeswax in place of the hard paraffin, and satisfactory products, but of a more adhesive character, obtained up to a proportion of about 15 per cent.; above this amount of the beeswax an adhesive ointment not easy to remove and painful to rub on a tender skin, but very useful for such purposes as protecting the fingers for a *post-mortem* or vaginal examination, was obtained.

Other experiments to prepare a firmer base by adding various proportions of cocoa butter, cocoanut oil, nucoline, cocos white, palm oil, carnauba wax, ceresin, and wool fat were made, which need not be detailed. It will be sufficient to state that satisfactory ointments were obtained from the addition of hard paraffin, ceresin, carnauba wax or beeswax not exceeding 15 per cent.; cocos white 50 per cent.; a soft paraffin of high melting-point (46° C.) was satisfactorily stiffened by 5 per cent. of hard paraffin. Hydrous wool fat 25 per cent. somewhat stiffens a soft paraffin of low melting-point, and renders it more adhesive; the product is slightly harder, but closely resembles the "parenol" of the *British Pharmaceutical Codex* formulary, which contains 65 per cent. of soft paraffin, 15 per cent. of anhydrous wool fat, and 20 per cent. of water. Like all water-containing ointments, this does not keep well.

Several formulae suggested by Lucas,[2] and modifications of them by Bagley,[3] were made up and found to be satisfactory as pharmaceutical products, but too hard for medical use in the great majority of cases where ointments are required.

Conclusions.

In the course of these experiments it became evident that the factors which go to make up the perfect ointment base are still not completely understood.

Chemical composition seems to be chiefly of importance in that the glycerine esters of the higher fatty acids and the cholesterine fats are absorbed more readily than the hydrocarbons. It does not, however, follow that *all* drugs are more easily absorbed from these bases, since we still lack information as to the readiness with which they part from the drugs with which they may be combined; neither do we know what effect the volatility of certain drugs has upon the rate at which the base may give them up to the tissues, or whether a drug dissolved in the base behaves differently from one which is merely mechanically mixed with it.

The physical properties alone of the bases do not seem to explain their relative values as ointment bases; the melting-points are certainly of the first importance, but some substances which are too hard for ointments have melting-points below those of comparatively soft bases.

A number of specific gravities have been taken, but have so far been of little assistance; a few experiments upon the specific heat and upon the relative viscosity at different temperatures have also been done; these experiments are difficult, as the ordinary apparatus for the determination of these factors is not suited for this special kind of work, and much time is required to obtain a constant result. So far no conclusions can be drawn from these experiments.

One essential point appears to be that an ointment is better for most purposes when it melts gradually, and this is apparently the reason why a mixture of fats or hydrocarbons (provided that the difference between their melting-points is not too great) is better as an ointment base than a single pure fat or hydrocarbon with a sharply defined melting-point.

My thanks are especially due to Mr. James Grier, M.Sc., who has given me much help in the experimental work. I also desire to thank the various firms who have kindly provided me with certain samples; among them I must mention more particularly the Cheeseborough Company, the Dee Oil Company, the Vacuum Oil Company, Messrs. Loders and Nucoline, and Messrs J. Woolley Sons and Company.

REFERENCES.
[1] BRITISH MEDICAL JOURNAL, July 22nd, 1911, p. 161. [2] *Chemist and Druggist*, 1912 and 1913. [3] Ibid., 1912.

EIGHTY-FIRST ANNUAL MEETING
OF THE
British Medical Association.
Held in Brighton on July 23rd, 24th, and 25th.

PROCEEDINGS OF SECTIONS.

SECTION OF GYNAECOLOGY AND OBSTETRICS.

ROBERT SANDERSON, M.B.Oxon., President.

PRESIDENT'S INTRODUCTORY REMARKS.

DR. SANDERSON, after expressing a welcome to those present, said they would find the subjects to be discussed covered a wide field of interest; and some of them, at any rate, illustrated the truth that their speciality was becoming less and less limited to the boundaries of the pelvis, that the pathology and treatment of disease of the pelvic organs in women demanded more and more a wide view of the principles of biochemistry, the functions of remote ductless glands, and of other general physiological problems as yet either half-solved or the solution of which, if it came at all, would be known only to a later generation. He then called for the opening of the first discussion.

DISCUSSION ON THE BEST METHODS OF DEALING WITH MALPOSITIONS OF THE UTERUS,

ESPECIALLY WITH REFERENCE TO RETRO-DISPLACEMENTS AND PROLAPSE.

OPENING PAPERS.

I.—Mrs. MARY SCHARLIEB, M.D., M.S.Lond.,
Consulting Gynaecologist to the Royal Free Hospital, London.

IN March this year (1913) there was a very important discussion in the Obstetric and Gynaecological Section of the Royal Society of Medicine on the subject of displacements of the uterus, which embraced a consideration of the indications for various operations, their technique, and results. A good many gynaecologists—amongst whom, unfortunately, I must reckon myself—were unable to be present and share in this discussion. It is, therefore, of great advantage to us that this subject has been assigned

for one of the discussions at this Annual Meeting of the British Medical Association.

The diagnosis and treatment of displacements of the uterus is a professional duty that falls to the lot of every practitioner of medicine. It is, indeed, one of our most important duties, because although displacements of the uterus seldom or never lead to a fatal result, yet they frequently cause an amount of suffering and disability that make them of first-class importance to women and to those who care for their welfare.

I suppose I may take it for granted that many cases of displacement cause no discomfort and need no treatment, and that of those which do need treatment the great majority are treated from first to last by means of various mechanical appliances, and that it is only the very small minority that are submitted to operation of any kind. I think I may also take it for granted that the days of the use of all varieties of intrauterine stem are gone for ever, and I wish I could say that all varieties of cup and stem and other pessaries taking their bearings from any form of pad and bandage were likewise entirely obsolete. The great majority of the members of our profession are quite convinced that cup and stem and other kindred pessaries are dangerous, but we still occasionally meet with a patient wearing such an instrument. A few months ago I saw a woman, aged 62, who was living in the extreme west of America, and on whom fell the burden of all the domestic work for a household consisting of herself, her husband, and two sons. She had an aggravated form of prolapse of all the pelvic viscera. It was very inadequately supported by a boxwood cup and stem pessary. The pressure of the cup against the cervix had produced ulceration, which, as the microscope showed, had involved the deeper layers of the mucous membrane and appeared to threaten the development of malignant disease.

Among the rarities of practice I might mention a custom prevalent some years ago among the natives of Madras, who used to insert into the vagina a fruit about the size of a large orange which has a woody rind; it is known as a "wood apple," and in one instance I had the ill fortune to be called on to remove one of these objects; it was said to have been *in situ* many years. I had to extract it with a pair of midwifery forceps; in the course of the delivery it broke, with the result that my anaesthetist and assistants fled before the appalling odour. The poor woman's vaginal walls were deeply ulcerated, but she recovered under the usual methods of disinfection and cleanliness.

Probably the forms of pessary most commonly used may be classified under two heads: (1) The many varieties of simple ring pessaries; and (2) the still more numerous modifications of Hodge's lever pessaries. Practitioners who have been at work, as I have, for some thirty-five years must have seen the rising and the setting of many stars of different magnitudes in the galaxy of pessaries, but the buckets, the cradles, the stems, and many other varieties which enjoyed more or less reputation, have, we may be thankful to observe, been thrown on to the scrap heap. With the greatly improved methods of conducting labour, with the now universal rule of immediate repair of the perineum, and with the increasing diligence with which practitioners examine their patients a month or so after childbirth, we ought to find that the necessity for the use of pessaries and of operations to cure the result of lacerations are becoming less frequent.

Unfortunately the time has not yet come when displacements of the uterus have ceased to be a matter of interest and importance to patient and practitioner. We are still obliged to use pessaries, much as we regret the inconvenience they cause in all cases and the disagreeably septic discharge which is their less frequent accompaniment. We are still constantly called upon to diagnose displacements from other abnormal conditions, and to decide whether in the individual case before us the best treatment is by use of soluble pessaries and douches, by mechanical pessaries (whether rings or Hodges), or whether some form of operation is indicated.

In the brief time at my disposal you will not expect me to go minutely into the question of the choice of pessaries, their use and their abuse. I would rather say a few words about the operations that have been advocated, and relate my own experience of their indications, technique, and results.

In view of writing this paper I have looked over my notes for the last eighteen years, and find that during that time I have records of 93 cases in which I opened the abdomen with the intention of correcting displacements of the uterus, either as the sole indication for the operation or as part of a more general procedure.

As there is evidently some uncertainty as to the nomenclature of the various abdominal operations for the correction of retrodisplacements and prolapse of the uterus, may I take it that, for the purposes of this discussion, we shall by "ventrisuspension" mean the mooring of the uterus to the anterior abdominal wall by means of its round ligaments, and by "hysteropexy" we shall mean the sewing of the uterus to the anterior abdominal wall, and that under these two heads we will not consider Alexander's operation, nor the Alexander-Adams operation, nor any variety of doubling or crimping the broad ligaments, nor the slinging of the uterus by bringing the ligaments together behind it and the sewing of them to its posterior aspect? I do not want to inflict upon you details of operations, but if you will permit me I should like to clear the ground by saying that the form of ventrisuspension I practise consists in drawing a loop of the round ligament on each side through the peritoneum, the rectus, and the fascia, about ¾ in. to 1 in. from the median line, and the sewing of them to the fascia and to each other.

The hysteropexy I do consists in passing a suture of silkworm gut through the fascia and peritoneum of one side, through the musculature of the uterus as low as possible on its anterior surface, and out through the peritoneum and fascia of the opposite side. Two more sutures are passed in a similar fashion at intervals of about half an inch or less; thus the uppermost suture is placed below the level of the origins of the round ligaments, leaving the whole of the fundus, the posterior wall, and some portion of the anterior wall of the uterus free to expand during any subsequent pregnancy. I have never placed the suture in the fundus itself, still less have I invaded the posterior aspect of the organ.

It seems a little unenterprising to have limited myself to these two operations so far as abdominal operations on the displaced uterus are concerned, but as they have given me satisfaction and commend themselves to my judgement, I have thought it better to continue their use. No doubt there must be plenty of gynaecologists here present who prefer other methods and will be prepared to tell us about them and about their results.

According to my records, of the 93 patients 71 were married women and 22 single. With regard to age incidence, two of my patients were under 20, nine between 20 and 25, seventeen between 25 and 30, twenty-five between 30 and 35, sixteen between 35 and 40, twenty between 40 and 45, while only four were over that age. As to the conditions for which the operations were done, so far as the uterus itself was concerned there were 39 cases in which retroversion was very distinctly the dominant condition. In 22 cases there was marked retroflexion, in 25 prolapse or procidentia, in 6 cases the uterus was variously retrodisplaced and adherent, and in the remaining case the uterus was extremely mobile, at one time anteverted, and at another time retroverted. Of course, in many cases the abdomen was not opened simply with a view to correcting the malposition of the uterus. Indeed, the operation was primary in only 20 per cent. of my cases. In at least 15 cases appendicitis, acute or chronic, was the real reason for opening the abdomen; in 20 cases the operation on the uterus was combined with ovariotomy; in 2 with myomectomy.

With regard to perineal operations, some form of operation on the perineum such as the old-fashioned Lawson Tait, or Kelly's operation for the reduction of the vaginal outlet, or Holden's operation for the restoration of the perineal body was done at the same time. With these anterior colporrhaphy was frequently combined, and in a smaller number of cases there was also repair of the cervix, amputation of the cervix, and dilatation and curettement. The most extensive combination in my list was in the case of a woman for whom I did anterior colporrhaphy, Holden's operation, appendicectomy, and

hysteropexy, complicated with the removal of a large bunch of tuberculous glands from the mesentery. This was a lady who expressed her determination to have her money's worth, and I think we may hope she had it.

As to the results of the operations, I am thankful to say that not one of my patients died or was seriously ill. A good many of them bore children subsequent to the operation, and so far as I have been able to ascertain there was no dystocia.

I attribute this to my not placing the sutures high on the anterior wall nor invading the posterior aspect of the uterus.

So far as I know the stitching or suspension has been efficient, but I must confess that in a certain proportion where the anterior colporrhaphy was not sufficiently thorough there has been a return of the prolapse of the anterior wall of the vagina. I think the way to obviate this is to denude a large surface of the anterior wall more or less in the form of a triangle. The base should be just in front of the vaginal insertion of the cervix and its apex towards the urethra; care should be taken to completely free the bladder from its attachment to the anterior vaginal wall and sufficient mucous membrane cut away to really narrow the surface while a good hold is obtained on the cut edges so as to reproduce a median raphe starting from just in front of the cervix uteri and ending at the urethra.

Rectocele, which is one of the most distressing complications of prolapsus uteri, is only too likely to return in a very disappointing fashion if the operation for its relief does not include the freeing and drawing together of the levatores ani as described by Holden. In this operation the mucous membrane of the posterior vaginal wall is widely denuded; the rectum is entirely freed from its attachments to that wall and drops away, thus permitting the freeing of the levatores ani, and the bringing of them together in the median line with buried sutures, the operation being easily completed by the oversewing of the vaginal mucous membrane.

I should very much like to know the experience of other operators. Mine has been that Holden's operation is absolutely satisfactory in its results, but that the patients are apt to suffer from considerable irritation of the bladder during the first week or so of convalescence, and I suppose that this must be due to interference with the nerves, for the bladder itself does not come into its scope.

More and more I have come to find that in those cases where the disability is bad enough to warrant operation one ought to do, at any rate, an anterior colporrhaphy and some form of perineal operation in addition to a hysteropexy or a suspension. In many cases, in addition to these operations, the uterus needs curetting, while occasionally the cervix is so unhealthy or so badly torn as to demand amputation or trachelorrhaphy.

II.—Dr. Hans Schlimpert,

Freiburg.

Since Marion Sims in England, and Hegar in Germany, first described their operations for prolapse, a host of methods with the same purpose in view has been recommended. In medical science, when many remedies are proposed with one object in view, it is safe to infer that the multiplicity is due less to the enthusiasm of discovery than the unsatisfactory nature of the results obtained with the older methods.

In these endeavours to better the technique and results in prolapse operations, broadly speaking, two methods, based on two theories of origin of prolapse, have been followed. The one theory maintains that in cases of prolapse there is a weakness in the suspensory apparatus of the uterus and vagina, and the other that there is a defect of the supporting tissues—especially of the muscles of the pelvic floor. As a result of the former there have been developed the operations of fixation and interposition, while the latter has led to colporrhaphy, perineoplasty, and more recently to suture of the muscles of the pelvic floor—especially the levatores ani.

A more satisfactory basis was established, and the subject took on a new life, when Halban and Tandler, of Vienna, in their well-known monograph, showed—

(1) That prolapse is a hernia through the levator opening;

(2) That the chief cause of prolapse is a congenital or acquired defect in, or separation of, these muscles; and hence,

(3) That the only logical method of dealing with the problem was to unite these muscles.

Since then this type of operation has been largely performed, but there are still a few who object to it—Hastings Tweedy, for example, in Britain, and Bumm and his pupil, Martin, in Germany.

Allow me now to present to you the methods adopted, and the results obtained, in the Freiburg clinic, under the direction of Professor Krönig. From the beginning we have been enthusiastic supporters of the muscle theory, and have performed the suturing of the levatores in accordance with the technique in vogue at the moment.

On purely theoretical grounds, however, and because of the tendency for failure to follow our operations in the more severe cases, we began to doubt whether we had included in our sutures the levatores or only the superficial muscles of the perineum.

Accordingly we experimented upon the cadaver, and found that in most cases we had only approximated the superficial perineal muscles, especially the transversus perinei profundus, and that it was really impossible, with the methods in use, to unite properly the edges of the levatores. Therefore we have evolved *a new and more radical method*, the chief principle of it being, first, to cut through the transversus perinei profundus in order to get access, and then to suture the levators.

Along with the myorrhaphy of the levatores an anterior and posterior colporrhaphy is performed, and, in addition, an antefixation of the uterus by the Alexander-Adams operation or by vaginal fixation. Only occasionally, and at the beginning of our experiments, did we perform Kocher's ventrifixation.

In the case of elderly multiparae resection of the Fallopian tubes for the purpose of sterilization is usually performed in addition.

Now I come to the results. From July, 1909, to July, 1912, we performed 272 operations, including cases where the levatores were isolated as described above and others where this was not done. To every one of those patients we wrote letters and asked them to come to be re-examined in the clinic again; 169 came down from the hills of the Black Forest and were carefully examined.

Of course, not a very long time has elapsed since operation, the longest being four years; but most of the patients are peasant women, and their conditions of life and work are very hard, and dispose to recurrence.

The 99 cases of suture of the perineal muscles *without* isolation of the levatores included 13 cases of total and 86 of partial prolapse. Two of the total prolapse cases showed recurrence, and one of the partial. Of the 68 cases of isolated separation and suture of the levatores, 15 were total and 53 partial prolapse cases. None of the total prolapses had recurred, and but one of the partial.

This last result may appear peculiar, but we were not astonished at it, because, in our opinion, the prognosis depends not so much upon the partial or total form of the descensus as upon the condition of the levatores. I wish to lay particular stress upon this point. In all our cases we have tested the levatores per rectum before and after operation, and we find some cases of total prolapse with the levatores well developed, and, on the other hand, cases of partial prolapse with very poor or almost totally absent levatores. The former have a good, the latter an unfavourable, prognosis. Indeed, when we examined the clinical records of our failures, we found that the levatores were noted before operation to be very poor or absent, and bad prognosis given.

From these observations, and from another factor still to be mentioned, we derive the indications for operation in cases of prolapse. This additional factor is the mortality involved in the new method as compared with the older methods.

In our 272 cases we have to record 3 deaths—that is, 1.1 per cent. mortality. One of those followed the non-separated suture, and two the isolated myorrhaphy. All three died from septic condition caused by an abscess of the operation wound. Perhaps this may be due to defective technique, and the mortality may decrease with its further development and with increased experience.

It is clear, however, that the much more difficult technique of the suture of levatores conduces to greater haemorrhage, and disposes, therefore, to a higher mortality than does the very simple colporrhaphy. Our mortality is about the same, or perhaps rather less, than that of the Schauta-Wertheim interposition operation.

We must conclude that the suture of the levatores has to be regarded as a more effective, but also as a more dangerous, operation than simple colporrhaphy. Therefore we would give the following as indications:

If the levatores are strong and their separation under two fingerbreadths when examined per rectum, we deem colporrhaphy to be sufficient.

If the span between the levatores is about two fingerbreadths, we would advise the suture of the non-isolated muscles.

If the levatores are weak and the span three to four fingerbreadths, we would isolate the muscles and then perform myorrhaphy.

If the levatores are not palpable, we deem the case to be unsuitable for conservative operation, and advise the colpokleisis of Peter Müller.

[Dr. Schlimpert's paper was illustrated by a series of coloured drawings showing the stages of Krönig's operation for isolation of the levatores ani, and was followed by a demonstration on the cadaver.]

III.—Henry Corby, M.D., M.Ch., Q.U.I.,

Professor of Obstetrics and Gynaecology, University College, Cork.

We know that, in the great majority of cases, uterine displacements are the direct result of parturition, and accordingly we find that the immediate causes are relaxation of the uterine ligaments and of the vaginal walls and increased weight of the uterus. To these is usually added rupture of the perineum, and lately it has been asserted that tears in the pelvic cellular tissue are also responsible. To my mind, it seems that the excessive weight of the uterus and the relaxation of the vaginal walls, especially the posterior vaginal wall, are the causes to which we should devote special attention when treating these displacements. For the moment I will devote my attention to retrodeviations uncomplicated by adhesions.

Whilst it is self-evident that the undue weight of the uterus is a very important factor to be dealt with, apparently the relaxation of the vaginal walls, or, as I would put it pointedly, the lengthening especially of the posterior vaginal wall, has not at all been adequately recognized as one of the dominating causes of retrodeviation.

Whilst pondering on this aspect of the question, I must say I was largely influenced by recollecting a passage in Hart and Barbour's excellent manual on gynaecology describing the action of a Hodge pessary when in position. Here is what these writers say:

> The posterior vaginal wall runs round the upper bar as on a pulley, and as it is inserted into the cervix the latter is thereby drawn upwards and the fundus thrown forwards.

Further on they state:

> Another way of showing how the Hodge pessary acts is as follows. With the patient lying on her left side, pass the index finger into the posterior fornix vaginae and push it up in a direction parallel to the vaginal wall. This necessarily pulls the cervix back, and thus the fundus is kept forward.

This was running very close to the mark, but the writers failed to indicate that the posterior vaginal wall had been made tense. This tension you can easily note by examining before and immediately after the introduction of an easily fitting Hodge.

The production of this tension is what I aim at both when I am replacing the uterus and also when I adopt surgical measures for keeping the fundus in the normal position. Here is how I replace the uterus. I put the patient on her back. Then I introduce the index and middle fingers of the right hand high up in the posterior fornix and press the body of the uterus upwards and forwards as far as I can. Then I turn the pulp of the fingers towards the posterior vaginal wall and pull downwards as if I were endeavouring to empty the rectum, and by that means sometimes cause a portion of the redundant mucous membrane to protrude outside the vaginal orifice. Next, whilst I keep up the tension with one finger I put the other on the anterior surface of the cervix, or, as I frequently do, I transfer both fingers at once to the anterior surface of the cervix and press the cervix backwards and upwards. At the same time I dip the tips of the fingers of my left hand through the abdominal wall behind the uterus and hook the fundus forwards so as to produce a condition of exaggerated anteflexion.

By this method the replacement can be effected with great facility, and usually at the first attempt. Sometimes I turn the patient on her side before the replacement is quite completed. Though I found it an advantage to have the patient in the dorsal position, I was at first at a loss for an explanation, as apparently gravity would tend to keep the body of the uterus in its abnormal position. But, on thinking the matter over, it flashed across my mind that in nearly all cases of retrodeviation you have a laceration of the cervix, great or small in extent, with concomitant cervical inflammation. This cervicitis too often means cystic degeneration, sclerosis, considerable enlargement, and consequent increased weight of the cervix. Accordingly, when the woman is placed in the dorsal position, the heavy cervix falls backwards and aids the upward and forward movement of the body and fundus. You may now ask why do I draw on the posterior vaginal wall in a downward direction, and my answer is, because I want to procure the tension which I have already shown leads to the pulling of the cervix in a backward and upward direction, thus facilitating the tilting upwards and forwards of the body and fundus. I very seldom am obliged to have recourse to the sound for the replacement of a retrodeviated uterus, and for many years past, when I do use it, I adopt a modification which I have seen recommended only in one manual on gynaecology, and that quite recently, though I believe the method is an improvement.

We know that one disadvantage of the sound is that its point pressing distinctly on the anterior wall of the uterus is liable to damage it. Accordingly, when I have introduced the sound in the ordinary way with its concavity looking backwards, I bring the handle, which is now near the pubes, gradually backwards till I press firmly against the perineum. In that way, when moving the body of the uterus out of its abnormal position, I have the much larger surface of the back of the sound pressing against the anterior wall of the uterus. I then do the *tour de maitre*, completing the further forward movement on the point of the sound, aided, of course, by the fingers of my left hand on the abdomen. It may be well to say that, when bringing the handle of the sound back to the perineum, I always keep the index and middle fingers on the anterior lip of the cervix to prevent the sound from slipping out of the uterus, which it is very liable to do.

Now comes the question of how to keep the uterus in position, and before adopting any measures for the purpose we must carefully consider the causes which in each individual case produced the retrodeviation. In some instances, especially when the trouble is of recent origin, pessary treatment with such adjuvants as douching, etc., may be successful. On the other hand, it may occur to you that it will be necessary to open the abdomen, either for the purpose of stitching the fundus to the anterior abdominal wall or in order that you may shorten the round ligaments by one of the various methods suggested. Between these two extremes—pessary treatment and coeliotomy—we have operative vaginal methods, which have given me satisfactory results, and these measures apply to perhaps the vast majority of the cases which come under our notice. Take a typical example: There is endometritis; there is cervical laceration, perhaps it is not extensive, but the cervix is enlarged, possibly elongated, or the ectropion due to the laceration may be so great as to cause the lower part of the cervix to take the shape of the top of a mushroom; in any case the cervix is unduly heavy. Then you find prolapse of the posterior vaginal wall, and, it may be, also of the anterior wall; and, finally, there is laceration of the perineum.

In such circumstances I dilate the cervix and curette the uterus. Then I do trachelorrhaphy or amputation of the cervix as may be indicated, and if I select trachelorrhaphy, especially if there is a mushroomed cervix, I know I must remove a considerable amount of tissue to bring the extreme edges of the lips together, but more especially to lessen the weight of the cervix. Now comes the crux—How am I to deal with the prolapsed vaginal

walls? Many of you, no doubt, would reply, do colporrhaphy. If I consult gynaecological books I find posterior colporrhaphy means removal of an elliptical portion of the mucous membrane of the posterior vaginal wall, the long axis of the ellipse corresponding with the long axis of the vagina, and that the object of the operation is to produce narrowing of the posterior vaginal wall. But I do not want this narrowing. What I do want is shortening of the posterior vaginal wall, and accordingly I perform what I will call transverse colporrhaphy. About 1 in. or 1½ in. above the margin of the perineum I make a crescent-shaped incision, the concavity of the crescent looking upwards. I then dissect upwards and remove the portion of mucous membrane in such a way that the upper margin of the denuded surface is also crescentic, but with the concavity looking downwards. Thus I have formed an ellipse with its long axis running at right angles to the long axis of the vagina, and I stitch the edges together by means of silkworm-gut sutures. The amount removed will, of course, depend on the laxness of the wall. The net result is that I have shortened the posterior vaginal wall and produced the tenseness which I have pointed out is so essential for keeping the uterus in its normal position. I then do transverse colporrhaphy on the anterior wall if the laxness should be sufficient to indicate it. Then, if required, I do perineorrhaphy. All can be done at the one sitting. Sometimes at the hospital a belated student comes in and in an undertone asks one of the nurses what operation I am doing, and she whispers in reply, "All the 'orrhaphies."

I have not had an extended experience of such operations as stitching the fundus to the anterior abdominal wall or of the many operations devised for shortening the round ligaments, because I have come to the conclusion that it is in comparatively few instances almost any one of these operations would be requisite, and, perhaps I may add, justifiable. I have done ventrisuspension, where you aim at producing an artificial ligament between the fundus and the anterior abdominal wall, as distinct from ventrifixation, where you cause an actual adhesion of the fundus to the anterior abdominal wall. I have not kept notes of my ventrisuspension cases, but with regard to four that I remember I can give a few particulars, which I think you will find to be interesting.

1. Mrs. O., aged 31, mother of three children, a widow three years. I operated on her on December 30th, 1904. She got married for the second time a year after the operation. Menstruation ceased a week after marriage, and when six months pregnant she had a miscarriage, which she attributed to an attack of "gastric fever," from which she suffered at the time. During the second pregnancy she had splendid health and was delivered of a boy at term. Her labour was very quick.

Third pregnancy. She came to me stating that for about three weeks her sight had been very bad. I found a quantity of albumin in the urine and diagnosed optic neuritis. This diagnosis was verified by an ophthalmic surgeon. I got her into hospital and her sight steadily improved, but rather suddenly became very bad when she was three weeks under my observation. She stated she was then seven months pregnant. With a view to relieving tension, I ruptured the membranes, and about two days afterwards she was delivered of a boy, which lived half an hour. The sight in the right eye continued bad, but when she took her discharge from the hospital the sight in the left eye was very fair and she could get about her business practically without inconvenience.

Next pregnancy (fourth) she enjoyed excellent health the whole time; went to term, labour very quick, was delivered of a girl.

Fifth pregnancy. Was admitted to hospital May 10th, 1913. The previous day she noticed her sight failing. A quantity of albumin was found in the urine; she complained of vomiting and very severe headache. Soon after admission she was nearly blind, but under treatment her sight commenced to improve. Thirteen days after admission had miscarriage; she was then four months pregnant. The fetus, a male, was macerated, though quickening had occurred since admission. Vomiting had ceased prior to miscarriage. To-day (May 26th) when I am writing this paper headache is gone, sight in left eye improved; is doing well generally.

Was the optic neuritis in this patient in both instances produced by the ventrisuspension? Did the pregnant uterus, owing to absence of normal mobility, press unduly on the bladder and ureters and thus produce the kidney disease which led to the optic neuritis? What is in favour of that is that in the two pregnancies, the third and fifth, in which the neuritis occurred the fetus was a male. On the other hand, why was it that during the second and fourth pregnancies she felt in excellent health and went on to term without any development of optic neuritis, and in spite, too, of the fact that in one of these pregnancies, the second, the fetus was also a male.

2. I did ventrisuspension on Miss F., aged 32, who, strange to say, was a sister of the previous patient. The operation was performed on August 23rd, 1905, and she got married in January, 1907. Her first child was born about ten months after marriage. She has had three entirely, all girls; the pregnancies were normal; first labour slow, the others very quick; has been in splendid health since the operation.

3. Mrs. L. In this case the retrodeviation recurred, and when I saw her some years afterwards she refused to submit to any further operation.

4. Mrs. D. Though I had carried out careful antiseptic precautions during the operation phlegmasia dolens developed. I saw her about two months after she had left hospital. The uterus was then in position. I have not been able to trace her further history.

All these four were obstinate cases of retrodisplacement. As you have seen, in three of them the fundus was retained in a forward position. But if I had four exactly similar cases now I would far prefer operating vaginally on lines such as I have indicated. Shortening the round ligaments does not appear to be as much in favour as it was some years ago, and it seems obvious that in the effort to hold the fundus forwards these ligaments are made more taut than they would be in the natural condition of affairs, and that accordingly the mobility of the uterus is diminished. There is a likelihood, too, that under these circumstances, as in cases of ventrisuspension or ventrifixation, intestinal peristalsis may be interfered with or actual obstruction result. It is not necessary for me to say much with regard to the treatment of prolapse of the uterus, as we have pretty much the same state of affairs as we find in retrodeviations—lessening the weight of the uterus and performing transverse colporrhaphy being usually indicated. I may mention that I examine the patient a month after the operation. If you find then that there has been some recurrence of the displacement you may feel pretty certain that you have been too parsimonious in the removal of cervical tissue or of vaginal mucous membrane. But even if you are obliged to have recourse to pessary treatment the probability is that at her next visit your patient will tell you that she feels decidedly more comfortable than she was before you operated.

DISCUSSION.

Dr. Arthur Giles said that he found himself in complete accord with Mrs. Scharlieb's observations on the question of the technique of operations for pelvic displacements; and he congratulated Dr. Hans Schlimpert on his interesting demonstration. He had on other occasions recorded the results of his operations for the treatment of displacements, and it was not necessary to enlarge on this aspect of the subject on the present occasion. He would rather confine his remarks to the question of indications, as this was the point on which there was likely to be the greatest divergence of opinion. Up to July 7th, 1913, he had done a hysteropexy in 569 cases, distributed as follows:

Chronic retroversion	170 cases
Prolapse	75 ,,
Procidentia	123 ,,
Retroversion with pelvic inflammation ...	54 ,,
Displacements with fibroid tumours ...	45 ,,
Displacements with ovarian tumours, tubal pregnancy, or tubal inflammation	102 ,,
Total	569 ,,

In the last three groups there was usually no divergence of opinion as to the necessity for operation, but there was probably a divergence of view as to the performance of a hysteropexy at the same time. His own practice was this, that if he were operating for tubal or ovarian conditions, and knew that the patient had a chronic displacement, he considered it a kind and proper procedure to sling up the uterus at the same time, to save the patient from future trouble. In the first three groups, however, there was considerable room for difference of opinion, because it was chiefly a question of pessaries *versus* operative treatment. There were cases where operation was unsuitable or out of the question, and other cases where the temporary wearing of a pessary would

lead to a permanent cure, by which he meant that the patient was able to do without a pessary; pessaries, therefore, were still necessary. His feeling, however, was that they were a necessary evil—necessary sometimes, but evil always. Therefore he frankly advocated surgical interference—even when a pessary held the parts up perfectly well—in cases where a patient appeared to be condemned to the wearing of a pessary for an indefinite number of years. The drawbacks of the pessary were numerous and obvious, and he held the view that patients were entitled to have relief from pessary treatment, in just the same way that the radical cure of hernia allowed patients to dispense with the wearing of a truss.

Mr. Christopher Martin (Birmingham) expressed his entire agreement with Mrs. Scharlieb's opening remarks and her judicious summary of the treatment of uterine displacements. He was also much indebted to Dr. Schlimpert for his lucid description of his operation. The speaker looked upon prolapse of the uterus as due to a stretching of the pelvic fascia, not to a lesion of the vaginal mucous membrane, and only to a slight extent to the pelvic muscles. It was, in fact, a hernia of the uterus through the pelvic fascia, just as an inguinal hernia was due to the protrusion of intestine through the stretched fibrous structures of the inguinal canal and rings. He thought Professor Corby was wrong in attributing displacement of the uterus to stretching of the mucous membrane of the posterior vaginal wall. He was putting the cart before the horse; the displacement of the uterus might cause stretching of the vaginal mucous membrane, but not vice versa. The aim of plastic operations for prolapse should be the restoration of the pelvic fascia. He submitted that the success of Dr. Schlimpert's operation—for suturing the levatores ani—depended on the bringing together of the separated fibrous sheaths of the muscles and the pelvic fascia. Any good that might result from Professor Corby's transverse colporrhaphy he thought was due to the bringing together of the fascia behind the mucous membrane. He agreed with Dr. Giles that pessaries were still a necessary evil. If they operated on all women who were at present made comfortable with pessaries, they would have to enlarge sixfold their gynaecological hospitals. He believed the best pessary for prolapse was Simpson's shelf pessary. No doubt, if too large a pessary were inserted, or if it were left in too long—over three months—without being changed, or if the patients did not douche regularly, trouble would result and inflammation or ulceration of the vagina occur. In cases calling for abdominal section he preferred ventrifixation to any of the round ligament operations. It was important to insert the sutures through the anterior wall of the body of the uterus below the level of the round ligaments. This left the fundus unattached, and if pregnancy occurred it was free to expand.

Dr. Cuthbert Lockyer (London) stated that a consideration of all the malpositions of the uterus would lead to too wide a discussion to be adequately dealt with in the time allotted for the subject, and he would therefore confine his remarks to the special reference to backward displacements and prolapse—especially as retroflexion and descent were so commonly associated and so frequently met with. Although backward displacements and prolapse were often in company they were none the less met with singly—that is, they might find descent of the first degree without backward displacement and also backward displacement without descent. Similarly they found descent and backward displacement with or without prolapse of the vaginal walls, and therefore the state of the latter could be ignored in discussing the treatment of uterine prolapse; and the same remark applied to the bladder, since in uterine prolapse of the second degree this organ might lie mainly outside the vulva. For the purpose of discussion, therefore, it would seem most fitting to divide the treatment as follows: (1) The treatment of uncomplicated retrodisplacement; (2) the treatment of uncomplicated descent; (3) the treatment of descent of the uterus, accompanied by prolapse of the vaginal walls; (4) the treatment of descent of the uterus and prolapse of the vaginal walls and the bladder. Many cases of simple backward displacement required no local treatment; this applied especially to young single women. With this class of patient, if symptoms were severe—for example, if menorrhagia, leucorrhoea, dysmenorrhoea, and sacralgia were present—curettage and ventrisuspension were preferable to treatment by pessaries; but such cases were few. When simple backward displacement was associated with dyspareunia and sterility, and the husband's virility had been proved by examination of semen, after reposition of the uterus, a Hodge pessary should be the treatment in the first instance. If the presence of a pessary proved objectionable, it was justifiable to offer the patient the advantage of ventrisuspension; again such cases were few. Simple descent of the uterus was not infrequently met with after parturition. In many of these cases prolonged rest in bed, massage, and tonics were all that was required. In fact, attention should be directed to the accompanying subinvolution of the uterus. A watch-spring or vulcanite ring pessary might be necessary for a few months, especially in the case of poor women who had to resume their ordinary household duties. Descent of the uterus complicated with prolapse of the vaginal walls was met with in varying degrees, and the treatment would vary accordingly. A ring pessary was the most suitable form of treatment in cases of minor degree, but its success would necessarily depend upon the size of the vaginal outlet and the integrity of the pelvic floor. Where the perineum was deficient, curettage of the subinvoluted uterus and colpoperineorrhaphy were indicated. For advanced cases of uterine prolapse of the second degree, with the vaginal walls and bladder prolapsed outside the vulva, the speaker performed the following operation:

1. The anterior vaginal wall is stripped from off the bladder.
2. The bladder is freed from its attachment to the cervix.
3. The freed bladder is invaginated and the anterior edge of the invagination cup is stitched to the isthmus of the uterus high up under the peritoneal reflection.
4. The cervix is then amputated.
5. The vesical posters (fibro-muscular aponeurosis of the pelvic floor) are picked up on either side and brought together in the mid-line, thereby covering the front of the cervical stump and the invaginated bladder.
6. The excess of the vaginal flaps is now removed, the fresh edges united by continuous suture in the mid-line.
7. Finally an extensive posterior colpoperineorrhaphy completes the operation.

The fundus uteri is not suspended to the anterior abdominal wall.

Pregnancy had followed this operation within eighteen months of its performance without any sign of a recurrence resulting. For complete procidentia in very old subjects he preferred Le Fort's operation to any other procedure. Only in cases where there was strong contraindication to the administration of a general anaesthetic would he prefer external supports (such as Napier's or Cutter's stem pessary) to operation. For retroflexion and retroversion complicated by adhesions or by tender prolapsed ovaries, laparotomy and ventrisuspension should be performed, but he did not find it necessary to employ ventrisuspension for "prolapse." It was quite true that in the second degree of prolapse the fundus uteri became retroflexed, but the symptoms in these cases were not due to the retrodisplacement of the body of the uterus, but to the associated displacement of the bladder, and often to the increased weight of the uterus. The latter was dealt with by amputation of the cervix, and the former by a cystocele operation such as the one already mentioned. The fundus uteri could be left alone. Ventrisuspension as a primary procedure had but limited indications, and in taking this view the speaker found himself at variance with those operators who employed this operation frequently. He noted in Dr. Giles's book on the after-results of 1,000 abdominal operations that "ventrifixation" was performed in 22.2 per cent. of the cases. In Dr. Lockyer's own series of 733 consecutive abdominal operations, he performed ventrifixation or ventrisuspension on 41 occasions—that is, in 5.5 per cent. Again, Dr. Briggs of Liverpool had recorded over 600 cases treated by fixation or suspension of the uterus. It was thus quite clear that there were two distinct schools of opinion in regard to the value of these operations for backward displacements. For mobile retroflexion with symptoms such as bearing-down pain, sacralgia and menorrhagia, curettage, with the use of a Hodge pessary, was all that was necessary in the way of treatment. Up to 1906 he employed "fixation" of the uterus, passing two silk sutures

through the anterior part of the body of the uterus low down, so as to give the fundus free play, but after hearing Tod Gilliam describe his method of suspension at the Toronto meeting of this Association he had always used this method in preference to fixation.

Miss Ivens (Liverpool) referred more particularly to the method of Gilliam's operation, in which the chief flaw was the formation of internal apertures through which strangulation might occur. Out of 100 cases Miss Ivens had opened the abdomen in two for chronic pain and discomfort, and in both had found a loop of intestine lying loosely in the foramen. To remedy this, in 75 cases Miss Ivens had adopted Mayo's modification, where the round ligament was drawn through the peritoneum in the situation of the internal ring, so that no aperture was left. The speaker pointed out the advantage of a round ligament operation over a peritoneal fixation, owing to the hypertrophy of the muscular tissue in the former, whereas peritoneum stretched.

Dr. William Ritchie (Glasgow) stated that the operation selected for the treatment of retroflexion of the uterus depended on the individual case, but he would limit himself to one method of treatment. He had had more satisfactory results with round ligament suspensions in complicated cases, such as fixed retroflexions or cases in which pessary treatment and colporrhaphy had failed, than with any other operation. He had records of over 40 cases in which he had seen the patients at least six months after operation. In most of them the records were for a longer period. The cases were consecutive, missing out those with records of less than six months. Out of those one was unsuccessful in keeping the uterus in anteflexion. The patient in this case developed an acute pneumonia immediately after operation, and the suspending sutures gave way as the result of the prolonged coughing. He subsequently operated on her, and found the uterus and ligaments *in statu quo ante*. He again resorted to a suspension by the round ligaments, with good result, the uterus being in good position more than six months afterwards. One of his patients became pregnant, and had an uneventful full-time delivery, and he had had the opportunity of examining 8 others after delivery at full time, and found the uterus anteflexed. In the examination of these cases months after operation the suspending ligaments had not appreciably elongated, and the uterus was found closely situated to the anterior abdominal wall. This he verified in one of his cases in which he had to perform an ovariotomy eighteen months after a round ligament suspension had been undertaken. In 3 of his cases a hysteropexy had been already performed—one five months previously. In all 3 the uterus was in retroposition but attached to the anterior abdominal wall by long bands from 4 inches in length in one case to 2¾ inches in another. In one there were two bands of attachment. In those cases the resulting bands stretching across the pelvic cavity antero-posteriorly were undoubtedly a source of danger. In his unsuccessful round ligament case the result was as before operation, with no danger resulting. The remarkable power of the round ligament to retract, as shown after full-time pregnancy, justified its use in suspension in women during the reproductive period. In all of these cases he had drawn the ligament through peritoneum, muscle and fascia, which gave a stronger suspension than through peritoneum and muscle alone. An objection was advanced against this method in that a hernia might result. He would like to deal at the same time with another fault that was found—that by pulling taut the end of the ligament distal from the uterus a foramen might result through which a loop of bowel might pass and become strangulated. To overcome these two objections he had lately cut the ligament such a distance from the uterus as he required. After having partly freed the suspending uterine portion from the broad ligament, it was passed through the muscle and peritoneum in the usual way, and then through the fascia at a level about 1 inch higher. This could easily be done, as a longer piece of ligament was obtained by this method. The likelihood of hernia was thus diminished. This method had some advantages over the ordinary Gilliam's operation. In Gilliam's operation the suspension was only obtained by that part of the ligament proximal to the uterus, the distal portion having no suspending power and causing one of the objections to the operation. By this method the same suspension by the same part of the ligament was obtained, and the objection was eliminated. The only function of the round ligament was its mechanical suspension of the uterus, and when this was lost no harm was done by cutting it. The level of suspension varied according to the tension produced on pulling up the uterus, and no fixed point was chosen, such as the line between the anterior superior spines, which was selected by some operators. In addition to his own cases he had had the privilege of being associated with Dr. W. D. Macfarlane in over 150 cases of round ligament suspension which he had performed, and his results along with his own had confirmed him in the opinion that this operation gave much better results than ventrisuspension; and where pessary treatment failed, or was unsuitable, it should be adopted as the operation of election for the severer cases of retroflexion of the uterus. He concluded (1) that round ligament suspension was satisfactory; (2) that this operation could be performed on women during the child-bearing period with impunity; and (3) that it was a much more satisfactory operation than hysteropexy.

Dr. R. L. Dickinson (New York) was keenly interested in contrasting English and American practice. In the States the almost universal use of catgut for ligature and buried suture prevailed. Small sizes (for example, Nos. 1 and 2) were employed. Fine silk was used for bowel and silkworm gut for external stay stitches in the abdomen and pelvic floor. Retroversions giving no symptoms, and uncomplicated by lacerations or tumours, should be left alone. Pessaries had a field of usefulness in pregnancy and *post partum*, in cases curable within six months by pessary-wearing, in cases inoperable because of the general condition—for example, the prolapse of certain old women, and lastly, while waiting the menopause in women not really crippled by pelvic symptoms. There was a happy medium between the skilful surgeon who refused to take time to try a pessary, or sweepingly condemned them, and the gynaecological practitioner who, for lack of opportunity to develop surgical skill, fostered the lamentable "office habit." He rejoiced to see an open mind on the matter here. There were fashions in pelvic work, and in America the pendulum had swung strongly away from Kelly's suspension, which anteverted the uterus by delicately stitching the back of the fundus to the abdominal wall. Ventral or vaginal fixation was limited to cases of prolapse in sterilized or post-climacteric women. For retroversion the round ligament operations were in great favour, but extraperitoneal shortening was rarely resorted to because no view of the organs was obtained. Intra-abdominal mural shortening (Gilliam) and ante-uterine plication (Coffey) were fairly popular. Retro-uterine plication (Baldry, Webster) was extensively used, and appeared specially adapted to correct varicose broad ligaments, and to lift swollen ovaries from the cul-de-sac. Interposition operations had been popularized by Watkins, but were only suitable for small uteri. Hysterectomy in retroversion was reserved for fibroid uteri (myomectomy having been practically abandoned), for intractable menorrhagia, or, with some operators, for badly adherent uteri associated with pus tubes. The wearing of a pessary after operative correction had lessened the speaker's recurrences from 9 to 3 per cent. Hysterectomy for incomplete prolapse, while theoretically indefensible, gave in practice excellent results, and furnished a thick bridge of united broad ligaments to which the prolapsed bladder and vagina could be made fast (Goffe). For prolapse in old women he recommended a trial of the pessary, and taught them to remove and leave it out at night. He considered the American practice as regards the restoration of the pelvic floor (following some of the above operations) to be more thorough and complete than he had seen in Germany, or, judged from hearsay or book knowledge, to be the case in England. Buried knots were danger spots, and personally he depended upon a single continuous catgut suture in three or four tiers, the first in the "levators" and the last subcuticular. He expressed his gratitude to Dr. Schlimpert, and congratulated Dr. Giles on his full and exact statistics.

Mrs. Scharlieb, in reply, thanked Dr. Schlimpert for his able demonstration of an improvement on Holden's operation by restoring the power of the deep transversus perinei in addition to the restoration of the levatores ani as taught by Holden, but asked why there should be any mortality in these plastic operations. She ventured to differ from Dr. Corby, and thought it could not too strenuously be insisted that *no* fixation stitches should be inserted in the fundus or posterior wall of the uterus. Massage of the vagina and perineum was practised long ago by Thüre Brandt of Stockholm. It was good treatment for incipient and slight cases of pelvic relaxation, but for obvious reasons it was a treatment to be used by women doctors only. Dr. Lockyer and Dr. Ivens urged the claims of Gilliam's suspension of the uterus. It was excellent, but must be limited to cases in which the round ligament was well developed. Professor Dickinson of New York mentioned with approval the performance of hysterectomy in severe cases of prolapse; but surely an operation of such severity should not be done for conditions which involved inconvenience but not danger, and which were remediable by less severe measures.

Dr. Schlimpert fully agreed with Mrs. Scharlieb that the ideal result would be an operation without mortality, but even with simple colporrhaphy an occasional death would occur. It meant a lot to a working woman to have her incapacity relieved, and to completely cure them some risk had to be run. He could not agree with Mr. Martin as to the prime importance of the fascial sheaths. This tissue was difficult to find even in the cadaver, and in general surgery, as in radical cure of a hernia, failure would result if the muscles were not brought together. He fully endorsed Dr. Lockyer's views on the cure of cystocele.

Professor Corby indicated that Mr. Martin had misunderstood him in regard to the elongation of the posterior vaginal wall. He (Professor Corby) believed this to be a result and not a cause, and his operation was intended to restore the original condition of affairs. He found that an efficient pelvic floor was produced by the retraction of the muscular tissue which had been separated from the removed portion of vaginal mucous membrane. He had had several cases where women suffering from menorrhagia, leucorrhoea, sacral pain, and nervousness had reported themselves as well and comfortable after the operation he had indicated.

DISCUSSION ON AFFECTIONS OF THE URINARY TRACT COMPLICATING PREGNANCY.

OPENING PAPER.

By Sir Halliday Croom, M.D., F.R.C.P., F.R.C.S.E., F.R.S.E.,
Professor of Midwifery, Edinburgh University.

The subject upon which I have been asked to open a discussion is extensive and complicated, and it would be impossible for me, in the brief space of time at my disposal, to refer to, far less discuss, all the various complications that may occur in the urinary tract during pregnancy. I must confine my remarks to a selection of those conditions which seem of most interest.

For the successful conduct of pregnancy, the practitioner must observe three essential points—first, the careful adoption of antiseptics; secondly, the accurate measurement of the pelvis; and lastly, what we are specially interested in to-day—namely, the regular examination of the urine of a gravida.

It is impossible to over-emphasize the importance of this proceeding. All of us who have had much experience of consulting work know how often the neglect of it has been the cause of hopeless disaster; because, while it is perfectly trite to say that as yet we have no certain and uniform means of dealing with that interesting and ghastly syndrome of symptoms known as eclampsia, yet, by careful examination of the urine, we can ward it off. Eclampsia can, by careful attention to the examination of the urine, be prevented in most cases.

It must be admitted that the liver and kidneys are the most vulnerable point in the body during pregnancy. Valuable information regarding the general metabolism is got from the urine, and its frequent examination is an absolute duty. It should be examined every three weeks until the seventh month, and then every two weeks. If there is any suspicion of toxaemia, it should be examined every day. By this procedure many cases of probable eclampsia and toxaemia may be anticipated.

Pathological conditions found in the urinary tract are numerous, and it would, as I have said, be beyond the scope of this present communication to refer to them all.

Such a condition as retention of the urine associated with gravid retroversion has received attention from the days of Hunter onwards, and the frequency of its occurrence, both in hospital and private practice, has afforded ample opportunity for its study.

Stone in the bladder must be a very rare condition indeed in pregnancy and labour, because during the fifteen years I had charge of the gynaecological department in the Royal Infirmary I saw only one case of stone, and during the twenty years I have been obstetric physician to the Royal Maternity Hospital I have seen none. In my consulting practice also I have never seen a case of stone associated with pregnancy or labour. As is well recognized, the length of the urethra, its dilatability, and large bore, must account for the infrequency of this condition.

Let me now approach the subject of pyelitis during pregnancy, or, rather, the pyelitis of pregnancy. I am not dealing this morning with an acute manifestation of a pre-existing chronic affection of the pelvis of the kidney which existed before the woman became pregnant, or with one that has been developed from calculus or some other cause entirely independent of pregnancy. Such cases may be called pyelitis in connexion with pregnancy. I am concerned at present with an acute inflammation developed during pregnancy and dependent in some way on the pregnant condition for its causation. This may be called pyelitis of pregnancy or pyelitis gravidarum, having pregnancy as its exciting cause, and with, in the majority of instances, complete recovery after labour.

The first reference to this subject was made by Rayer in 1841, and then a further contribution was made in 1893 by Reblaub.

Time will not permit me to go into the history of this condition further. Suffice it to say that in recent years the condition has received very considerable attention. That the condition occurs more frequently than recorded cases would lead us to suppose may be very fairly assumed, as the condition is far from being generally recognized by the profession at large. The question arises, How does pregnancy directly cause this lesion? First of all, one may look at some of the conditions of pregnancy which predispose to its production.

It has been sufficiently shown by Olshausen, Löhlein, and others that the pregnant uterus may cause dilatation of the ureter or ureters, and thus place the kidney and ureter in danger of infection. For instance, it has been shown conclusively that in some few eclamptic cases, 25 per cent. at outside, dilatation of the ureters was present, both ureters being sometimes dilated, but generally the right one. This is entirely in keeping with the fact observed in pyelitis of pregnancy, that the right kidney is the most frequently affected.

Now, why should this be so? The explanation is to be found in the anatomical relation of the right ureter, as it crosses the brim of the pelvis, making more of an acute curve, and lying more exposed than the left ureter. An additional reason may be found for the compression of the right ureter, in the position of the uterus itself, which generally lies in the right oblique diameter. This would still further favour the pressure on the right ureter.

Much stress has been laid on the mechanical state of affairs during pregnancy as a contributing factor, namely, the pressure on the ureters, especially the right, by the head of the child. Personally, I have been unable to see how this could be a factor, for although the majority of cases of pyelitis occur between the fifth and eighth months, it often does occur earlier in pregnancy, before the presence of the head could act as a factor at all. Certainly, an explanation which seems a very rational one is that in the cystoscopic examinations made at my

request at the Maternity Hospital in Edinburgh, we found the mucosa of the bladder swollen and hyperaemic, as was pointed out by Mirabeau in 1907. Therefore a very slight pressure on the ureter would be sufficient to close its canal and obstruct the current of urine, thus forming a favourable nidus for all sorts of infection.

As to the modes of infection, they may either be ascending from the bladder or descending from the kidney, or through the blood current. I think there can be no doubt that the infecting agent in the vast majority of cases is the colon bacillus. Certainly in all the cases that have occurred in the hospital under my care that has been the most common infecting agent. This, however, is not exclusively the case, because gonorrhoeal infection, pyogenic infection generally, and tuberculous infection are also described. But unquestionably the colon bacillus is the most common.

The clinical picture varies. Sometimes the onset is very insidious indeed, at other times it begins suddenly and severely. For example, the patient, without any obvious reason, about the sixth or seventh month of her pregnancy is seized with acute abdominal pain. The pain is referred very often to the region of the bladder, sometimes to the kidneys, sometimes to both. It is often associated with nausea and vomiting. Frequently enough the pain is confined to the bladder alone, and associated with frequent micturition, along with a rise in temperature. The cardinal symptoms then are lumbar pain, pyuria, and fever. The pain becomes localized over the infected kidney, and deep pressure causes pain. Cystoscopic examination of the bladder shows it to be more or less inflamed. In simple cases the temperature drops in the course of four or five days, and in the course of two weeks the conditions are very often normal. On a bacteriological examination the quantity of pus varies in different specimens. The urine shows no change, except a little albumin to start with. In the course of a day or two the specific gravity may rise to 1020, and microscopic examination shows pus, blood corpuscles, granular casts, and rod-shaped bacilli.

Differential diagnosis from acute appendicitis, acute cholecystitis, typhoid fever, and salpingitis has to be made. Yet with the knowledge we possess of pyelitis in pregnancy, it is striking how often the condition is missed. I have confined these remarks to pyelitis during pregnancy, but it is not uncommon to find pyelitis during the puerperium, in which case a differential diagnosis is not so easy, as it is often a complication of puerperal sepsis.

The prognosis, as regards the mother, is quite good, the disease running its course in seven or fourteen days. Some cases continue until pregnancy is brought to a conclusion either by artificial or spontaneous delivery. The prognosis for the child is not so good. Premature spontaneous delivery often takes place, and in most or many cases the child is dead. Even in bad cases it is remarkable how rapidly the woman recovers after the uterus is emptied spontaneously, which is one of the reasons why I would be disposed to induce labour rather than operate on the kidney.

There can be no question that the pathological conditions associated with the toxaemias of pregnancy have attracted more attention of late than any other subject in obstetrics, but I am concerned only with the manifestations of toxaemia as far as regards the urinary apparatus. During pregnancy there seems to occur in the kidney an anaemia, with fatty infiltration of the epithelial cells, without acute or chronic inflammation. This condition of matters occurs very frequently (in 5 or 6 per cent.), and is associated with very mild symptoms, such as slight albuminuria, headache, and so on. It occurs so frequently that it has been called the "kidney of pregnancy." It is most likely that the condition is due to a diminution of the blood supply, produced by increased intra-abdominal pressure and contraction of the arterioles, owing to the increased products of metabolism in the blood of pregnant women.

The clinical significance of this so-called "kidney of pregnancy" is that, owing to the increased metabolism, the kidneys are suffering from extra strain being placed upon them. With appropriate treatment it passes off, but it must always be watched, as it is the earliest signal of toxaemia in pregnancy, and if unattended to, it is the precursor of serious eclamptic symptoms later. In respect of the nature of true nephritis occurring before pregnancy, or developed during pregnancy, the prognosis is much graver, owing to the extra amount of work thrown upon the kidneys. The differential diagnosis between a true nephritis and the "kidney of pregnancy" is often a very difficult matter. So far as the symptomatology is concerned, this much may be said, that if kidney disease exists before pregnancy, it will develop itself in the early months; whereas, if symptoms of kidney insufficiency develop themselves after six months, it may be presumed that the disease had its origin as a result of pregnancy. I am, however, concerned here not so much with its symptomatology as with the conditions of the urine. We are indebted to the work of Dr. Herbert Williamson, St. Bartholomew's Hospital, for a very original attempt to clear up this difficult subject. He asks two questions:

1. Can we distinguish between an albuminuria which is the result of a chronic nephritis, and an albuminuria due to pregnancy toxaemia?

2. In a case of chronic nephritis, can we tell when pregnancy toxaemia has been grafted on to the old kidney lesion?

If it can be established that acidosis is constantly found in pregnancy toxaemia and is not present in chronic nephritis, the onset of acidosis will prove a valuable indication that pregnancy toxaemia has been developed.

The question of acidosis is a profoundly interesting one. What is the significance of it in pregnancy? It is, of course, intimately associated with the toxaemias of pregnancy, and represents an alteration in the ammonia-urea-nitrogen ratio in the urine, accompanied by the presence of acetone and diacetic acid. Acidosis occurs in the vomiting of pregnancy, in diabetes, as we shall see further on, in starvation, delayed chloroform poisoning, and in eclampsia. It is impossible to refer to this subject without mentioning the important work of Dr. Swayne. It seems from his observations that acidosis, occurring in a pregnant woman suffering from albuminuria, indicates a pregnancy toxaemia; although, to prove this conclusively, an investigation of albuminuria in pregnancy without acid is necessary. So far this evidence is wanting, since all cases of albuminuria investigated show an acidosis. In all the cases he referred to the acidosis disappeared within a comparatively few hours after delivery, showing that pregnancy is undoubtedly the determining factor in producing the toxaemia, and its cessation leads also to the cessation of the toxic symptoms.

There can be no question that the condition which has attracted most attention of late is the toxaemia of pregnancy, specially as shown in pernicious vomiting and eclampsia. Pernicious vomiting has distinct pathological lesions, with urinary findings; they are not only present in all marked cases, but the degree in which they are present to a very large extent determines both the diagnosis and prognosis, and in no inconsiderable degree the treatment of the case. In the urine there are found acetone, oxybutyric acid, diacetic acid, indican, and albumin. Leucin and tyrosin crystals are frequently to be found by appropriate methods. In addition to these there is found an increase in the proportion of the total nitrogen excreted through the kidneys in the form of ammonia. In order to interpret the abnormal nitrogen output it is necessary to understand the normal nitrogen output, the so-called ammonia coefficient. The total amount of nitrogen excreted in the urine is, roughly speaking, composed of 90 per cent. of urea, 5 per cent. of ammonia salts, and 5 per cent. of nitrogenous bodies difficult to isolate. The proportion of nitrogen excreted as ammonia to the total nitrogen—that is, the ammonia coefficient—is, normally, about 5 per cent.

For the examination and elucidation of this question we are indebted to Whitridge Williams. Recognizing that in normal pregnant women the ammonia coefficient varied from 3 to 7 per cent., he pointed out that in women suffering from toxaemia it rose to 15 to 20 per cent. This work of Dr. Williams differentiated therefore the variety of vomiting by excluding neurotic and reflex forms. It is well known that this high ammonia coefficient is not specially characteristic of pernicious vomiting, but occurs also, as I have said, in starvation with profound inanition, and also as the result of delayed chloroform poisoning. Since writing his paper on the subject Williams has modified his opinion very consider-

ably, and shown that it requires a much higher percentage to establish a diagnosis of toxic vomiting than 10 per cent. He makes his position thus:

For clinical purposes we can regard a given case as toxaemic in origin whenever a seriously ill patient presenting a high ammonia coefficient (20 per cent. or more) fails to improve after a few days' complete rest in bed combined with suggestive treatment, energetic rectal feeding, and the administration of large quantities of salt solution per rectum and beneath the skin. Furthermore, the appearance of coffee-ground vomit, well-marked icterus, and a semi-comatose condition justify an almost positive diagnosis, provided chloroform has not been administered as an anaesthetic; and if death ensues characteristic hepatic and renal lesions will be found at the autopsy.

It is more and more becoming a recognized fact that induction of abortion should be confined to cases of pernicious vomiting, and in these only after the suggestions of Dr. Williams have been carried out. One of the difficulties associated with the ammonia coefficient as a means of diagnosis is that the method of making the estimation is difficult and can hardly be attempted by the general practitioner. To secure an accurate estimation a copious specimen should be sent to some laboratory accompanied by a note of the amount of urine passed in twenty-four hours.

It is probably somewhat incorrect to include glycosuria and diabetes under the heading of conditions of the urinary system, they being really diseases of metabolism associated with the liver and pancreas. But, as their diagnoses are only arrived at by careful examination of the urine, I think I may fairly include them. I have already referred to the presence of sugar in the urine. It occurs in about 5 per cent. of gravidae. True glycosuria is a comparatively rare occurrence, but pregnancy favours its production. The alimentary form is more easily produced in pregnancy, and there is often a transient glycosuria in the last weeks of gestation. It is not at all an uncommon thing to find in multigravid women a temporary or physiological glycosuria, which gives rise to no symptoms, but which is detected by routine examination of the urine. It is a purely evanescent occurrence, and the sugar disappears after labour is over. But neither the alimentary form of glycosuria, nor the transient form, are altogether to be overlooked, because, although they generally pass off without any serious symptoms whatever, at the same time they are occasionally the precursors of underlying serious diabetes. True diabetes—diabetes mellitus—however, is a very different matter. There glucose, diacetic acid, and acetone are all present, and albumin adds very considerably to the gravity of the case.

In looking at this matter one must differentiate between a diabetic woman who becomes pregnant and a pregnant woman who becomes diabetic. Where a diabetic woman becomes pregnant the prognosis is always a serious one, specially so in the acute cases, where dieting has little or no effect. One may roughly say that a glycosuria which does not respond to any treatment, dietetically or otherwise, is virtually diabetes. In this case the outlook for the patient is very bad, and the prognosis may be regarded as a grave one. Sometimes, however, where the diabetes is what is known as the alimentary type, the patient often goes on to term without any bad effect whatever. In diabetes it is a well known fact that sterility is common, and this accounts, to some extent, for the paucity of records of pregnancy in diabetes. When they do become pregnant, however, premature labour is very common, occurring in about 50 per cent.

The gravity of diabetes in pregnancy was long ago recognized by Matthews Duncan. He found the mortality in true diabetes was very high—50 per cent. died, 30 per cent. of them in coma. And in the children the results are equally disastrous—51 per cent. being stillborn and 10 per cent. dying within a few days after birth. There is no question that pregnancy has a very maleficent effect upon the course of the disease. It may develop a latent diabetes. The liver is at fault in diabetes, and is overburdened during gestation, and thus acute hepatic insufficiency is usually explained.

I am well aware of Neumann's paper, in which he records cases of pregnancy, labour, and childbed which took a normal course, and in which he found diabetes was no indication for terminating pregnancy. In none of his cases did pregnancy occur in true diabetics; but the glycosuria developed during pregnancy, a condition to which I have already alluded. Glycosuria occurring during pregnancy and remaining with greater or less persistence is a disease which comparatively seldom gives rise to any trouble. With due care as to diet and management, and so on, such patients can be tided over to full term very frequently. It is obviously important to make a clear distinction between glycosuria and lactosuria, as the latter is of no clinical significance at all.

If such is the condition of matters in pregnancy occurring in diabetics the question of treatment becomes an urgent one. It seems to me that the lines of treatment are perfectly definite. Should the sugar content of the urine diminish under appropriate treatment, then unquestionably the case ought to be allowed to proceed to the end. On the other hand, if at any time during pregnancy, whether before or after viability, serious conditions are discovered, such as acidosis, albuminuria, and acetonuria, and there is under treatment no diminution in the sugar, then induction of abortion or premature labour is the obvious course to be adopted. No advantage can be gained in early pregnancy by waiting for the fetus to be viable, because mostly the child either dies before or immediately after birth.

It must, however, always be kept in mind that coma is apt to supervene with the induction both of abortion and premature labour.

There is nothing special, as far as I know, in the delivery of a diabetic woman, except that as diabetes is accompanied by a marked acidosis, and as any muscular exertion may increase the acidosis, and so bring about an attack of diabetic coma, so the muscular strain of labour may precipitate the condition. The prognosis, therefore, in a diabetic woman is a very grave one. The labour should be as free from exertion as possible, and, as chloroform produces an acidosis in a healthy subject, it obviously ought not to be administered to a diabetic. With a view to preventing coma, an intravenous injection of sodium carbonate (a teaspoonful to a pint) should be used.

Lastly, haematuria complicating pregnancy is a somewhat rare condition. I have met with it twice. In both cases it was due only to a congestion of the vesical mucosa, the condition being similar to the one to which I have already alluded in cases of pyelitis. In one case the condition lasted for six months, and in the other for three months, before labour. After the completion of labour the condition subsided. There are obviously two varieties of haematuria: first, the result of actual disease, such as tuberculosis, solitary ulcers, foreign neoplasms; and secondly, the variety to which I have referred, which is due to the congestion of the bladder, as a cystoscopic examination during pregnancy reveals; or its origin may be in the kidney, from the pressure on the abdominal vessels or the ureter. It is quite possible that the condition may be the result occasionally of a toxaemia.

In conclusion, permit me to say that if further advances in connexion with these questions and the whole subject of toxaemia generally, upon which our ignorance is profound, are to be gained, there must be two changes in our maternity hospitals. The first is the establishment of prematernity beds. In the last few weeks this question has again been raised in Dr. Routh's eloquent valedictory address to the Royal Society of Medicine, but he is only bringing into special prominence what has been the constant plea of my colleague, Dr. Ballantyne, and what has been for years an accomplished fact in the Maternity Hospital in Edinburgh. So valuable have our prematernity beds proved, that in the coming alterations of our hospital we hope to have a small ward devoted to that particular purpose. The admission of patients in labour only is unsatisfactory, and the establishment of prematernity beds for the scientific investigation of patients is of the utmost importance.

Secondly, chemistry and chemical pathology in the elucidation of many of these obscure problems in obstetrics are of great importance. The pathological departments of our hospitals must, in the future, be in close touch with chemical laboratories; and it is probable that chemistry, so applied, will give us a better insight into these problems than can be gained at the bedside.

DISCUSSION.

Dr. HERBERT WILLIAMSON (London) asked, What did one know of the causes of pyelonephritis of pregnancy, what factors favoured its development, and to what extent was the mechanical pressure exerted upon the ureters by the gravid uterus responsible for its production?

It was generally accepted that pyelonephritis was preceded by an obstruction to the outflow of urine with consequent dilatation of the ureters and renal pelvis, that hydronephrosis was thus produced, and that the stagnant urine was subsequently infected by coliform organisms. Dilatation of the ureters was commonly found *post mortem* in women dying during the later months of pregnancy; the condition might be unilateral or bilateral; when unilateral the right side was affected in 84 per cent. of the cases, and when bilateral the dilatation was greater on the right side than on the left. The portion below the pelvic brim was usually unaffected; the portion above was elongated and dilated, but occasionally the dilatation involved the whole ureter down to its entrance into the bladder.

Such were the facts; what was the explanation? It seemed reasonable to believe that the compressing force was the uterus itself, which, as it enlarged, rose out of the pelvis, became an abdominal viscus, and obstructed the ureter at the spot where it crossed the brim of the pelvis and lay in almost direct contact with the bone. If this view were correct, the compression was due to the uterus itself, not to the lowest part of the fetus, for in the latter event, pyelonephritis would be most common during the last two months of pregnancy, whereas it commenced most often in the fifth and sixth months, when the largest circumference of the uterus occupied the brim of the pelvis. The greater frequency of dilatation of the right ureter was also explained on anatomical grounds, for the uterus lay obliquely so that the right border was rotated backwards and brought into contact with the posterior part of the pelvic brim, whilst the left border was rotated away from it. When the ureter was dilated throughout its whole length the conditions were more difficult to explain; the compression was generally attributed to the firm fibrous tissues of the ureteric canal; but this explanation was not satisfactory, and he suggested that possibly the valvular opening into the bladder might be obstructed by the altered anatomical conditions which existed during pregnancy.

He recognized fully the importance of the mechanical factors, but there was a tendency to lay too much stress upon them. Pyelonephritis the result of infection by coliform organisms was a very common disease at all ages, and even in children was much commoner in girls than in boys. It was met where no cause of obstruction in the pelvis could be found, where there had been no preceding constipation or gastro-intestinal disturbance, and independently of all the other conditions to which its onset during pregnancy was commonly attributed. The same distribution of lesions occurred in the gravid and non-gravid, for the right kidney was far more often affected than the left. During the last year he had had under his care three cases of what might be termed "pyelonephritis of the honeymoon"—cases in which the commencement of married life was followed by a severe renal infection; in all three cases the right kidney was affected primarily. It should be recognized also that dilatation of the ureter accompanied pyelonephritis in many instances where no pelvic tumour or other possible cause of obstruction existed, so that a mechanical obstruction could not be an essential factor in the production of the dilatation.

There was another fact very hard to explain upon the mechanical theory—why was pyelonephritis so seldom found in cases of flat pelvis or in pregnancy complicated with uterine fibroids? We should, *a priori*, expect it to be common; as a matter of fact it was very rare. These considerations made him think that perhaps the importance of the pregnancy had been over-estimated, and that one was apt to forget that, after all, pyelonephritis was one disease, whether the patients were or were not pregnant, and that its treatment must be conducted upon the same broad principles under whatever conditions it occurred.

The Infecting Organisms.—The term *Bacillus coli* was a generic name, including many different species, and he had been struck with the great variety of organisms isolated from his cases. A comparatively small number proved to be the classical *Bacillus coli communis*, and in the most virulent case of the series the infecting agent was the *Bacillus paratyphosus*. He laid stress upon this point to emphasize the uselessness of employing stock vaccines; if vaccines were used they must always be autogenous. He had sometimes, but not always, succeeded in isolating the same bacillus from the patient's faeces, and had often found that the organism was agglutinated by the patient's serum.

The Route of Infection.—He had elsewhere stated fully his reasons for believing that there were three different routes of infection:

1. An ascending infection, not through a column of stagnant urine, but through the chain of lymphatics in the wall of the ureter.
2. Through the blood stream; this method had been repeatedly demonstrated by direct experiment.
3. From the bowel, (*a*) through the wall of the colon as it lies in contact with the kidney; (*b*) through lymphatic connexions between the two viscera; (*c*) through an inflamed appendix adherent to either the ureter or renal pelvis.

Of these modes of infection, he regarded the first as the commonest and the second as the rarest.

With regard to *symptoms*, the speaker said: I have pointed out elsewhere[1] that the initial symptoms vary widely, and that we may recognize six different modes of onset:

1. Gradually developing malaise, with increasing lumbar pain.
2. A sudden acute attack of lumbar pain, followed by constitutional symptoms.
3. High fever, with at first no localizing symptoms.
4. Onset with marked urinary symptoms.
5. Onset with vomiting and abdominal distension simulating intestinal obstruction or peritonitis.
6. Onset with symptoms suggesting pleurisy or pneumonia.

But, whatever be the mode of onset, the following symptoms are common to the great majority of cases:

(*a*) *Pain* is the most striking feature of the disease; in many instances it is at first slight, is felt in the back, and is often described by the patient as "a dull ache like lumbago." Sometimes it is sudden and acute, felt over a wide area, and difficult to localize; in other cases it is referred to the iliac fossa, and raises suspicions of appendicitis; whilst more rarely it is felt in the lower part of the chest, and is suggestive of pleurisy or pneumonia.

(*b*) *The temperature* is raised, irregular, and remittent; it usually rises at night to 101° F. or 102° F. When the pus is pent up in the kidney, the temperature rises, and the discharge of a quantity of pus per urethram is usually followed by a fall of temperature. Rigors are common, and are sometimes of great severity.

(*c*) *The pulse-rate* is increased and varies from time to time with the pain, the temperature, and constitutional disturbance.

(*d*) *Vomiting* occurs during the paroxysms of the pain, and is sometimes a marked feature of the disease. Gastro-intestinal disturbances are often spoken of as precursors of the disease; they are, however, in reality often its earliest manifestations.

(*e*) *Constitutional Symptoms.*—Drenching sweats are often present and are of toxic origin. Anaemia, rapid loss of flesh, a sallow earthy complexion, furred tongue, headache, and constipation are nearly always found when the disease has lasted some days.

(*f*) *Abdominal distension* is usually only slight, but in some cases so marked that in association with persistent vomiting it has led to a diagnosis of intestinal obstruction.

(*g*) *Urinary Symptoms.*—Frequent and painful micturition is present in a relatively small number of cases. The urine is often at first diminished in quantity, later the amount is increased, probably as the result of treatment. Albumin is present in small quantities before the pus is discharged and active motile bacilli are found in large numbers. Pus cells are present in varying amount; epithelial cells, leucocytes, and a few red blood corpuscles

[1] *Kidney Diseases.* By W. P. Herringham. With chapters on Renal Disease in Pregnancy by Herbert Williamson.

are often seen, and, when the kidney substance is affected, epithelial and hyaline casts.

Blood Examination.—Pyelonephritis is usually associated with some degree of leucocytosis. In pregnancy there is normally a slight increase in the number of white blood corpuscles, but during the fifth and sixth months (the time at which pyelonephritis is commonest) they seldom exceed 10,000 per cubic millimetre in uncomplicated pregnancies. The absence of a leucocytosis does not exclude the presence of pus in the kidney; a patient was admitted to St. Bartholomew's Hospital, under my care, on January 15th, with a temperature of 100° F., a pulse of 96, pain in the loin, pus and motile bacilli in the urine, but with a count of only 8,200 leucocytes, although on the day previous to admission she had vomited and had a severe rigor. Such cases are, however, unusual, and we commonly find a leucocytosis up to 12,000 or 14,000 per c.mm.; in several of my cases it had exceeded 20,000. As stated previously, the *Bacillus coli communis* can seldom be grown from a blood culture. Agglutinins and bactericidal substances are often present, for in several instances we have found the patient's serum agglutinate a bacillus derived from the urine.

Treatment.—In the majority of cases medical treatment only is required, and as a rule marked improvement occurs within ten days. In carrying out the treatment there are five essential points:

1. Absolute rest in bed; the patient should be instructed to lie in the semi-prone position and on the side opposite to that infected, so as to cause the uterus to fall away from the pelvic brim and allow free drainage of the kidney.
2. *Diet.*—I do not believe strictly milk diet to be either necessary or desirable. I allow cocoa, custard, eggs, bread-and-butter, and boiled fish.
3. The ingestion of a large quantity of fluids such as barley water, or Vichy water, to which is added potassium citrate in sufficient quantity to render the urine alkaline.
4. Urinary antiseptics, of which the most valuable are urotropin and helmitol.
5. Free purgation.

Administration of serums have proved useless and the value of autogenous vaccines is still doubtful. If there is no improvement after this treatment has been persisted in for ten days labour should be induced. It is doubtful whether nephrotomy or nephrectomy are ever necessary.

Dr. H. O. Nicholson (Edinburgh) affirmed that the most important and interesting affection of the urinary tract complicating pregnancy was undoubtedly the kidney condition which arose in cases of grave toxaemia. The condition might develop very rapidly, and the entire secretory mechanism of the kidney was thrown out of action. Then, definite and unmistakable clinical features were present. There was complete, or nearly complete, suppression of urine, the urine secreted was loaded with albumin, and contained far too little urea, and, most important of all in his opinion, there was a striking increase in the arterial blood pressure. Later on convulsions and coma were very liable to develop.

Since this kind of suppression of urine occurred in women who had previously been healthy, and might subside under treatment, more or less rapidly, leaving the kidney as normal as before, it could not always be due to pathological changes in the organ. One might therefore consider the physiological aspect of this sudden incompetency of the kidney, which sometimes culminated in eclampsia, and he wished to show that it depended entirely upon an alteration in the renal circulation the nature of which it was possible to interpret from a study of some of the clinical features present in most cases.

When toxaemia was increasing towards the end of pregnancy the blood pressure rose higher, and then a very striking clinical feature was to be noted—namely, that in spite of the raised blood pressure the quantity of urine steadily diminished. Far too little notice had been taken of this phenomenon, and yet it was such a remarkable thing to find the secretion of urine abolished at a time when the blood pressure was abnormally high that it was worth while trying to interpret the condition of matters. He wished to explain the mechanism by which anuria was brought about in the toxaemia of pregnancy.

In order to do this one must bear in mind two important physiological points in connexion with the secretion of urine under normal conditions. The first point was that the secretion of urine increased and diminished with increased and diminished *flow of blood* through the kidney; to have urine properly secreted there must be a steady and uninterrupted flow of blood through the renal vessels. The second point, which was more important still, was that the amount of urine secreted was determined entirely by the height of the blood pressure in the *glomeruli* of the kidney—the height of the pressure in any other part of the arterial system counted for nothing.

In the toxaemia of pregnancy there was, without doubt, a powerful vaso-constricting substance circulating in the blood, a substance possessing very similar properties to the internal secretion of the adrenal glands. How did it affect the kidney so as to suspend the functions of the organ? As the toxic substance accumulated in the blood it caused contraction of the vessels, not only of the body generally, but of the kidneys in particular. This contraction proceeded to such an extent that the smaller branches of the renal artery became so much contracted that the flow of blood through the kidney was markedly diminished. That in itself would lead to a lessened secretion of urine. When the vaso-constriction proceeded still further the pressure of blood within the glomeruli naturally fell to a very low level indeed, and the secretion of urine could not be maintained. In this way the urine might be suppressed altogether, exactly as it would be if one put a ligature round the renal artery. In a case of this kind the brachial blood pressure, as estimated by the sphygmometer, was found to be enormously high. Thus in a severe toxaemia of pregnancy, by means of steadily advancing vaso-constriction, the arterial blood supply to the kidney could be gradually lessened until the circulation through the glomerular tufts was brought to a standstill, and complete anuria resulted. The toxin had, in fact, stopped its own excretion. This might sound like a fairy tale, but it was nothing of the kind. Digitalis and certain vaso-constricting drugs in poisonous doses did act upon the renal circulation precisely in this manner and produce suppression of urine. These circulatory changes leading to anuria might, of course, occur when the kidney happened to be affected by pre-existing disease, and then the symptoms might be somewhat modified.

The *post-mortem* appearances found in the kidneys, and also in the liver, lungs, and spleen, in eclampsia might, in his view, be ascribed to the intense venous congestion of these organs which resulted from the cutting off of their arterial blood supply. In all probability the toxin also acted as a protoplasmic poison. It was highly suggestive that the histological changes produced by the injection of large doses of adrenalin on some of the glandular organs of the rabbit, which W. B. Drummond had described, were quite similar to the changes found in these organs in eclampsia. It was possible, he thought, that the adrenal secretion really was the vaso-constricting substance which threw the kidney out of action in these cases. In normal conditions its powerful tendency to constrict the vessels was fully opposed by the thyroid secretion, which acted in entirely the opposite direction. These two internal secretions were definitely antagonistic as regards their effects upon the arterial calibre. Normally one might assume that the thyroid secretion was the opposing influence which safeguarded the renal circulation from dangerous over-action of the suprarenals. The thyroid was a most important antitoxic gland, and when there was excessive absorption of toxins from the alimentary canal—as might well happen in pregnancy—the gland might, and frequently did, become tremendously overtaxed. Sometimes—owing, perhaps, to a primary fault in the individual—the gland could not undergo a compensatory hypertrophy sufficient to meet the demands made upon it, and then the suprarenal action on the blood vessels was exerted to an extreme degree.

Dr. F. Edge (Wolverhampton) considered pyelonephritis to be an ascending infection due to decomposition and infection of stagnant retained urine. The germs came from the patient's rectum, and were due to want of cleanliness. Where infection occurred after use of a catheter,

he had been in the habit of ascribing this to an imperfectly sterilized instrument; where properly used, he considered that it did good by emptying the bladder. Exercise during pregnancy and the puerperium was advantageous in that it emptied the abdominal and pelvic viscera. The question of sterilization of a patient arose when pyuria recurred, and he had performed it on a patient who had had six children, and where he had induced premature labour in the seventh and eighth pregnancies. Vaccines had been of great service in his cases. In Birmingham they had prematernity beds and an obstetric out-patient department. A competent chemist and an expert bacteriologist and pathologist were very necessary, and it was to be hoped that some simplified method of estimating ammonia in the urine would be discovered.

Dr. H. BRAMWELL (Nunney, near Frome) confined his remarks to the pyelonephritis of pregnancy. It must be looked on as a coincidence rather than as a consequence, for it was very common in women and children as a whole. He did not think that pressure was a primary cause. There must be predisposing conditions, for pyelonephritis was not unduly common with fibroids complicating pregnancy, or with contracted pelvis. *Bacillus coli communis* was the most common cause, and the infection was not always an ascending one. The condition was often due to direct infection from the colon or appendix. The organisms in the ascending colon were more virulent than those in the descending colon, and this might partly account for the frequency on the right side. Further, the greater mobility of the right kidney was a predisposing cause by intermittent kinking of the ureter.

Dr. R. L. DICKINSON (New York) was of opinion that the infrequency of death from pyelitis gave value to the reports of findings of multiple subcortical abscesses in some *post-mortem* examinations. Irrigation of pus cavities was good surgery in general, but had not shown itself useful in pyelitis. The complicated chemistry of the nitrogen partition tests had not proved itself of practical value. The emphasis on urinary examination twice a month after the third month could not be too great, but, if they had to choose between urinalysis and blood pressure as a warning of eclampsia, they should choose the latter test. Every practitioner should be taught to take pressures in all late pregnancies, and it was inexcusable not to do so in all cases with headache or lessened quantity of urine.

Dr. R. MOWBRAY (Castlederg) stated that in his experience, which was confined to rural districts, urinary infections in pregnancy were very rare. In thirteen years, with an average of sixty confinements, he had not met with more than five which caused any trouble.

Dr. LEITH MURRAY (Liverpool) discussed the question of acidosis in pregnancy. He recommended to Dr. Edge and others interested the relatively simple methods of quantitative analysis which he had already communicated to the North of England Obstetrical Society (*Transactions*, December, 1912). These methods were: Groat's for total nitrogen, Mathison's for ammonia, and Hart's for acetone-complex bodies calculated as β oxybutyric acid. His experience of these in a long series of cases had been most satisfactory, and he was led by his results to insist on the distinction between acidosis and acid intoxication. In the latter these acid bodies were present in quantities capable of poisoning, while in the former they represented merely a symptom of altered metabolism. In pregnancy the importance of calculating these acid bodies quantitatively was emphasized, for here, unlike diabetes, the increased fraction of ammonia was no direct gauge to the excess of acid bodies. The "liver of pregnancy" apparently led to an arrest of the complete process of oxidation, more ammonia being liberated and less urea formed. In the majority of normal pregnancies there was an appreciable increase in the ammonia coefficient, and normal cases had been reported with the percentage as high as 17; yet in such cases there might be no trace of acetone bodies. He hoped, therefore, that, if these simpler methods came into more general use, the results obtained would be placed at their proper value. Great care was necessary for a correct interpretation. The direction in which the ammonia fraction of the total nitrogen was moving was of much more importance than the actual increase, and for this purpose frequently repeated estimations in toxic cases had infinitely more value than routine examinations of twenty-four-hour specimens. With regard to bacillary infection of the urinary tract, he recalled an observation of Stenhouse Williams, Wallace, and himself (*Journ. of Obstet. and Gynaec. of the British Empire*, August, 1912) that coliform organisms were to be found in one-third of normal female urines; the specimens on which this was based were obtained by intraperitoneal puncture of the bladder, thereby eliminating all urethral contamination. There was, therefore, a greater predisposition to infection in women than in men, where only in 2 per cent. of normal cases had coliform organisms been found. A considerable personal experience of the preparation and administration of vaccines in the pyelocystitis of pregnancy had convinced him and his patients of their undoubted merit.

A PLEA FOR EARLY OPERATION IN CASES OF UTERINE FIBROIDS.

By ARTHUR E. GILES, M.D., B.Sc., F.R.C.S.,
Surgeon to the Chelsea Hospital for Women; Gynaecologist to the Prince of Wales's General Hospital, Tottenham.

IT will be convenient to preface my arguments for early operation in the case of uterine fibroids by a brief reference to the alternate course. The passive or expectant method of treating fibroids may be expressed in the now famous phrase, "Wait and see"; that is to say, "Wait for the menopause and see how matters will improve."

What reasons can be brought forward in favour of the expectant method? The possible reasons are these:

1. That at the menopause the symptoms disappear and the fibroids tend to shrink.
2. That fibroids are not dangerous tumours.
3. That operation is attended by a high mortality, insomuch that the risk of operation is greater than the risk of leaving things alone; and that years of invalidism and disability are preferable to the running of this great risk.

I will deal with these reasons in turn.

1. This first reason is based on a succession of fallacies. The first is the assumption that the only bad symptom of fibroids is haemorrhage. Really, haemorrhage is only one symptom, and, moreover, it is a symptom only with some kinds of fibroids; the subperitoneal and many of the interstitial fibroids are not attended by any appreciable haemorrhage. The other symptoms—pain, pressure-effects, disability, and general weakness—are not improved by the menopause, and may be aggravated. The second fallacy is the assumption that the haemorrhage caused by fibroids is only menstruation; such an assumption could only be excused if made by a layman. The haemorrhage caused by fibroids continues for years after menstruation in the physiological sense has ceased; it may go on for years after the performance of double ovariotomy. I have met with two cases in which fibroids have occurred and required removal some years after double ovariotomy had been performed. The third fallacy is that fibroids shrink after the menopause; in many cases they actually increase in size; and in the few cases where a shrinkage occurs the effect may be worse than it was before, as a fibroid that lodged previously above the pelvic brim may become impacted in the true pelvis.

2. It is said that fibroids are not dangerous tumours. The same may be said of ovarian tumours, the danger of which lies in their possible complications. In the same way, the danger of fibroids, apart from the draining effects of haemorrhage, lies chiefly in their possible complications; and I shall show presently, by exact figures, how numerous and serious the complications of fibroids really are.

Moreover, if we could say with truth that ovarian tumours are dangerous but fibroid tumours are not, there still remains the question, Can we be sure, in

any given case, that the tumour is a fibroid? I shall show presently what dangerous results may follow such an assumption.

3. The argument based on the high mortality of operation would have had great weight twenty-five or even twenty years ago. I shall show that this mortality has dwindled with the progress of abdominal surgery, and that hysterectomy may now claim a recognized place not only as an operation for saving life, but also as a means of relieving suffering.

After this destructive criticism of the expectant method of treating fibroids, I will now proceed to the constructive work of giving my reasons for early operation. They are as follows:

1. The age-incidence of fibroids is so varied that no importance can be attached to age as an indication for operation.

2. Early operation would often allow of a conservative myomectomy, when delayed operation necessitates hysterectomy.

3. In a large proportion of cases fibroid tumours are associated with pathological complications, many of which are of a dangerous nature.

4. Diagnosis is still so uncertain that grave conditions, urgently requiring operation, may be mistaken for simple fibroids.

5. The mortality attendant on the procedures of myomectomy and hysterectomy in the practice of experienced surgeons has become so reduced that operation may legitimately be advised for the relief of suffering when life is not directly threatened.

1. *Age-incidence of Fibroids.*

I have particulars of the ages of 575 patients with fibroids operated upon by abdominal section. They were as follows:

Under 25	3 cases, or	0.5	per cent.
25–29	12 ,,	2.1	,,
30–34	57 ,,	9.9	,,
35–39	92 ,,	16.0	,,
40–44	155 ,,	27.1	,,
45–49	151 ,,	26.3	,,
50–54	73 ,,	12.7	,,
55–59	15 ,,	2.6	,,
60 or over	16 ,,	2.8	,,
Total	575	100.0	,,

The above table bears out the accepted view that the greatest incidence of fibroids is between the ages of 40 and 50, since 55.4 per cent. of the cases were from 40 to 49.

We may take the average age of the menopause as 48 or 49; consequently we find 104 cases, or 18.1 per cent., requiring operation after the age when the menopause might be expected to have become established; and 16 cases, or 2.8 per cent., requiring operation ten years after this date. The two oldest patients were aged 66.

On the other hand, 161 cases, or 28.5 per cent., were under 40, and would have had to wait at least ten years for the menopause; 72 patients, or 12.5 per cent., under 35 would have had to wait fifteen years; 15 patients, or 2.6 per cent., under 30 would have had to wait twenty years; whilst 3 of the cases, aged 24, 23, and 18, would have had to wait about twenty-six, twenty-seven, and thirty-two years respectively.

It seems evident, therefore, that it is quite time that the age question should be left out of consideration in relation to the operative treatment of fibroids, just as it is with ovarian tumours. When a patient is discovered to have an ovarian tumour operation is advised, whatever the age of the patient, and it should be the same with fibroids, with only this reservation, that whilst age should not affect the fact of operation, it may properly influence its nature; that is to say, that whilst hysterectomy should nearly always be done after the age of 45, myomectomy should always have the preference before the age of 30, and from 30 to 45 the decision should depend on the position, character, and number of the tumours.

2. *Conservative Myomectomy.*

There can be no question that the ideal treatment of fibroids is to remove the tumour and leave the uterus. Such a course is, of course, impossible or inadvisable in the case of multiple fibroids and cervix fibroids and in many cases of large fibroids, but when it is practicable it has two important advantages: First, because the uterus may be capable of subsequent child-bearing; and, secondly, because some women feel mutilated and unsexed by the removal of the uterus. With fibroids of long standing the chances of doing myomectomy are obviously less than with those of more recent development. It is my practice, when dealing with early fibroids in young women, to aim at myomectomy rather than hysterectomy, although myomectomy may be not only possible but also the better operation sometimes in older women. In the following table I have instituted a comparison of the number of cases of myomectomy and hysterectomy at different ages.

	Under 30.	30 to 39.	40 to 49.	50 and over.
Myomectomy ...	7 (46.7 %)	37 (24.9 %)	28 (9.1 %)	8 (7.7 %)
Hysterectomy ...	8 (53.3 %)	112 (75.1 %)	279 (90.9 %)	96 (92.3 %)
	15	149	307	104

This table shows strikingly how the proportion of myomectomies decreases and that of hysterectomy increases as the age advances.

The next table shows the number and percentage of patients of different ages in the two groups of myomectomy and hysterectomy.

Age.	Myomectomy.		Hysterectomy.	
	Cases.	Percentage.	Cases.	Percentage.
Under 25...	1	1.25	2	0.4
25–29	6	7.5	6	1.2
30–34	17	21.25	40	8.0
35–39	20	25.0	72	14.4
40–44	16	20.0	140	28.2
45–49	12	15.0	139	28.1
50–54	3	3.75	70	14.1
55–59	2	2.5	13	2.8
60 and over	3	3.75	13	2.8
Total	80	100.00	495	100.0

This table shows that 8.75 per cent. of cases of myomectomy, but only 1.6 per cent. of cases of hysterectomy, were under 30; 30 per cent. of cases of myomectomy, as against 9.6 per cent. of cases of hysterectomy, were under 35; 55 per cent. of cases of myomectomy, as against 24 per cent. of cases of hysterectomy, were under 40. After the age of 40 the value of conservation of the uterus becomes much less, and we find, accordingly, that 76 per cent. of cases of hysterectomy and only 45 per cent. of cases of myomectomy were over 40. The figures in the two tables fully bear out my contention that early operation will often allow of a conservative myomectomy, whilst delayed operation necessitates hysterectomy.

3. *Complications of Uterine Fibroids.*

I have analysed the complications present in 580 consecutive cases of uterine fibroids operated upon by abdominal section, and the results are shown in the subjoined table. They include 495 cases of hysterectomy, 80 cases of myomectomy, and 5 cases in which the fibroids were merely incidental to some graver condition and were left alone.

An Analysis of the Pathological Complications Present in 580 Consecutive Cases of Uterine Fibroids Operated upon by Abdominal Section.

I. Uncomplicated cases		170
II. Complicated cases:		
1. Degenerative changes in fibroids—		
Necrobiosis	50	
Red degeneration	9	
Fibro-cystic degeneration	11	
Calcareous degeneration...	8	
Necrobiosis and calcareous degeneration	5	
Sloughing	3	
Sloughing associated with bowel fistula ...	1	
Suppurating fibroid, ovarian abscess, septic peritonitis	1	
	—	88
2. Inflammatory disease of the tubes—		
Salpingitis and resulting adhesions ...	47	
Hydrosalpinx	16	
Haematosalpinx	2	
Pyosalpinx	18	
	—	83
3. Ovarian disease—		
Cystic ovaries	111	
Ovarian tumours	58	
	—	169
4. Malignant disease—		
Carcinoma of the uterus	5	
Carcinoma of the ovary	4	
Carcinoma of the sigmoid	4	
	—	13
5. Adeno-fibroma of the uterus		12
6. Pregnancy		8
7. Tubal pregnancy		1
8. Uterine displacements		36
		580

Total complications, 410 out of 580 cases = 70.5 per cent.

Dangerous complications:

Degenerative changes	88
Suppurative conditions	18
Ovarian tumours	58
Malignant disease	13

Total dangerous complications, 177 out of 580 cases, equals 30.5 per cent. of all cases and 43.1 per cent. of the cases of complications.

It will be seen from the table that complications were present in 70 per cent. of cases. Some of these complications were relatively unimportant as far as the danger to life is concerned; for example, non-suppurative disease of the tubes and uterine displacements are not dangerous conditions, though they may induce a great deal of suffering and invalidism; cystic disease of the ovaries may be unimportant, though it probably represents the early beginnings of ovarian cysts; adeno-fibroma is not in itself dangerous, though it may predispose to the development of adeno-carcinoma of the uterus. Pregnancy may be regarded as a purely accidental complication, and some writers on the subject rather make light of it; for my own part, I consider it may be one of the most formidable of the complications of fibroids.

There are, however, other complications that are intrinsically dangerous, including degenerative changes in the fibroids themselves, suppurative conditions in the pelvis, ovarian tumours, and malignant disease; and these four groups make up no less than 30.5 per cent. of all the cases of fibroids, and 43 per cent. of the cases of complications.

In view of the tendency that still exists to advocate waiting for the menopause, it appeared to me that it would be interesting to compare the complications in cases under the age of 50 with those in cases over that age, and such a comparison is shown in the following table.

It will be observed that whilst the total number of complications is only slightly greater above the age of 50, namely, 71.9 per cent., as against 70.4 per cent. under 50, the tendency to dangerous complications is markedly greater, rising from 28.2 per cent. under 50 to 39.8 per cent. over 50. Consequently the incidence of dangerous complications is in itself a strong argument against the "wait and see" policy.

A Comparison of the Complications in Patients under 50 and over 50.

	Under 50.		Over 50.	
	Cases.	Per Cent.	Cases.	Per Cent.
I. Uncomplicated cases	141	29.6	29	28.1
II. Complicated cases—				
1. Degenerative changes	69	14.5	19	18.1
2. Inflammatory conditions, non-suppurative	54	11.3	11	10.8
Inflammatory conditions, suppurative	15	3.1	3	2.9
3. Ovarian disease, cystic ovaries ...	99	20.8	12	11.6
Ovarian disease, ovarian tumours	46	9.6	12	11.6
4. Malignant disease	6	1.2	7	6.8
5. Adeno-fibroma	10	2.1	2	1.9
6. Pregnancy (uterine and tubal) ...	9	1.9	0	0.0
7. Displacements	28	5.9	8	7.8
Total	477	100.0	103	100.0

Total complications ... ... under 50, 336 out of 477 = 70.4 per cent.
Total complications ... ... over 50, 74 out of 103 = 71.9 per cent.
Dangerous complications ... under 50, 136 out of 477 = 28.5 per cent.
Dangerous complications ... over 50, 41 out of 103 = 39.8 per cent.

4. *The Uncertainty of Diagnosis.*

It is very easy to make mistakes in diagnosing uterine fibroids, and the mistakes are of two kinds. In the first place, one may diagnose only fibroids and find some other serious condition present also, such as uterine or ovarian carcinoma, ovarian tumours or pus tubes; in the second place the condition may not be a fibroid at all, but carcinoma of the uterus or a solid ovarian tumour.

The first kind of mistake is the more liable to occur, and I could recount numerous instances among my own cases. When a patient presents the history and symptoms of fibroids, including progressive menorrhagia and metrorrhagia, and various hard and irregular swellings are present in the pelvis and lower abdomen, it is a not unnatural inference that all these swellings are fibroids; and indeed, often there is nothing in the history of the case to lead one to think otherwise. In this way I have found pus tubes and ovarian tumours present in a number of cases. The table of complications shows 18 cases of pus tubes and 58 cases of ovarian tumours, and in most of these cases the complication was not suspected beforehand. In 4 cases uterine fibroids were complicated by ovarian carcinoma: two of the patients died subsequently of recurrence; one had a recurrent mass of growth which was enucleated from the broad ligament, and she has so far remained well for two years and two months; the fourth was operated upon seven and three-quarter years ago, and has so far remained well. In two cases an unsuspected carcinoma of the body of the uterus was found, in addition to fibroids; one patient has remained free from recurrence for six and a quarter years; the other has had recurrent nodules in the vagina and vulva, which have been removed, the last only a few weeks ago. I may mention, as a final example of a formidable complication, the case of a patient who had known for seven years that she had a tumour.

Five weeks before I saw her she was seized with acute pain and rapidly became very ill. She came up to my out-patient department at Tottenham, and she looked so ill that I kept her in. She had an enormous mass of tumours impacted firmly in the pelvis and extending up to the epigastrium. Her temperature on admission was 101° F. On opening the abdomen, several pints of pus were found free in the abdominal cavity; a tumour full of pus was adherent in the pelvis; a second, also full of pus, was connected with the front of the uterus, and appeared to be a breaking-down fibroid. The only chance for her was to clear out the suppurating masses, but she succumbed to shock just as the operation, which lasted an hour, was being completed.

Of mistakes of the second kind I will relate only five well-marked examples:

One was a patient of 75, with a hard solid tumour filling the pelvis. I diagnosed uterine fibroid and made arrangements to operate with all possible speed to minimize shock. It turned out to be an ovarian fibroma, the removal of which was so simple that the whole operation took just ten minutes. I saw the patient three years later, when she looked very well.

The second was a patient, aged 60, with an enormous solid tumour. Dr. Champneys had seen her ten years before and diagnosed uterine fibroid, and advised waiting for the menopause. Meanwhile the tumour grew steadily, and after some years she was advised that it was too large for removal. When I saw her I also diagnosed uterine fibroid and advised operation, as the patient was incapacitated; it turned out to be an ovarian fibro-adenoma, weighing 30 lb. The operation was exceedingly simple, and the patient remains in excellent health four years after the operation.

In the third case the patient had been seen by Dr. Herman, who diagnosed uterine fibroids; he asked me to take her into the Chelsea Hospital for Women for operation, and when I saw her I concurred in the diagnosis. It turned out, however, to be a mass of extensive malignant disease in the pelvis too far advanced to allow of removal. The patient lived about ten months in great pain and distress.

The fourth case was a patient of 39, stout and well nourished, with a history of metrorrhagia. The uterus was about the size of a man's fist, the cervix looked healthy, the os externum was nulliparous. When the uterus was removed there was no fibroid, but a large mass of carcinoma occupied the body of the uterus, and an apparently separate endocervical growth of carcinoma extended down nearly to the external os. The operation took place only recently (on July 14th).

The fifth was a patient aged 32, who had a uterine tumour the size of a cocoanut; when it was removed, by hysterectomy, it turned out to be a case of hydatids of the uterus.

5. *The Diminishing Death-rate of Hysterectomy and Myomectomy.*

It may be laid down as a surgical axiom that highly dangerous operations are justified only when undertaken for the saving of life, whilst operations that are attended with a small risk may legitimately be undertaken for the relief of suffering.

Twenty-five years ago hysterectomy was a highly dangerous operation, with a mortality ranging from 25 to 40 per cent., and the operation of myomectomy was unknown. Clearly, with such a mortality, hysterectomy could be advised only when life was seriously threatened; and when it was only a case of suffering and disablement it was best for the surgeon to hand the patient over to the priest, who should prescribe patience and fortitude; for it is, after all, better to live as an invalid than to die cured.

We cannot base the treatment of fibroids to-day on the mortality of twenty-five years ago. Hysterectomy, as we understand it, is an operation radically different from that which was done then, and the following table shows the phenomenal diminution of mortality. It will be sufficient for my purpose to record the results of hysterectomy for fibroids at the Chelsea Hospital for Women for five successive quinquennial periods, and my own results of hysterectomy for fibroids and fibrosis, and of myomectomy, during the sixteen years that I have been performing these operations. The results in other hospitals and of other operators would be somewhat similar.

Mortality of Operations for Hysterectomy and Myomectomy.

1. Analysis of results of hysterectomy for fibroids at the Chelsea Hospital for Women for twenty-five years, from 1886 to 1910:

	Cases.	Deaths.	Mortality.
1886–1890 ...	14	5	35.7 per cent.
1891–1895 ...	12	5	41.6 ,,
1896–1900 ...	150	16	10.6 ,,
1901–1905 ...	345	18	5.2 ,,
1906–1910 ...	487	9	1.8 ,,

2. Analysis of author's results of hysterectomy for fibroids and fibrosis for sixteen years, from July, 1897, to July, 1913:

	Cases.	Deaths.	Mortality.
1897–1900 ...	10	0	0.0 per cent.
1901–1905 ...	89	6	6.7 ,,
1906–1910 ...	234	7	3.0 ,,
1911–1913 ...	217	2	0.92 ,,
Total ...	550	15	2.7 ,,

3. Author's results of myomectomy:

1898–1903	19 cases,	2 deaths.
1904–1913	61 ,,	0 ,,
Total	80 ,,	2 ,,
Mortality ...	2.7 per cent.	

We see from this table that in the last quinquennial period, to the end of 1910, at the Chelsea Hospital for Women 487 hysterectomies were performed with a mortality in all cases, serious as well as simple, of 1.8 per cent.; during that period my own mortality was 3 per cent. for 234 cases, and in the last two and a half years I have had two deaths in 217 cases, a mortality of 0.92 per cent. Previous to these two deaths there was a series of 110 consecutive recoveries; and there was a series of 90 between the two.

The indications for an operation whose mortality is 30 per cent. are necessarily very different from the indications when the mortality is only 1 or 2 per cent. My contention is that whereas formerly hysterectomy could only be advised in urgent cases of life and death, it is now indicated in the far more numerous cases in which patients suffer constant pain and discomfort and are chronically incapacitated by the drain of haemorrhage and the pressure of tumours on surrounding organs; and further, that the relief of patients in these early stages is not only curative of chronic ill-health, but also preventive of many dangerous complications.

How often one has had to reflect, "If only this operation had been done years ago, how much suffering would have been saved, and present danger, or fatal disaster averted!"

To sum up, early operation allows of conservative procedures whereby the uterus is preserved in many cases where delay entails the inevitable sacrifice of the uterus; it saves patients from many years of suffering and disablement, enabling the workers to earn their living and the leisured to enjoy life; it averts many complications that are the direct result of fibroids and makes it possible to deal with independent complications that would otherwise be overlooked; it save patients from the serious consequences of mistaking for fibroids tumours that are even more dangerous; it prevents the health and life of patients from being sacrificed to the exploded fallacy of the "waiting for the change of life"; and it saves the surgeon, as he contemplates a life lost by needless delay, from the mournful reflection—

> Of all the sad words of tongue and pen
> The saddest are these, It might have been.

DISCUSSION.

The President, after congratulating Dr. Giles upon his paper and his results, asked (1) what considerations decided Dr. Giles as between myomectomy and hysterectomy, and (2) how he dealt with large cavities in the uterine wall left after myomectomy.

Dr. Purslow (Birmingham) had recently met with a case in which pyometra simulated a fibroid. The patient, 60 years of age, had had a blood-stained offensive discharge for twelve months, and, on examination, the uterus was found to be as large as a five and a half months gestation and acutely retroflexed in a sacculated form, the cervix being high up behind the pubes and reached with difficulty; the vaginal cervix was normal. Degenerated fibroid complicated by malignant growth of the endometrium appeared to be the probable diagnosis. On abdominal section the condition was found to be a pyometra of unusual size, with an epitheliomatous growth high up in the cervical canal. An extensive panhysterectomy was performed with successful result.

Dr. R. L. Dickinson (New York) thought that most American operators were limiting myomectomy rather strictly. His own rule was to restrict it practically to (1) polypoid submucous protruding or infected growths, removed by the vaginal route, with hysterotomy and morcellement if needed; (2) single or pedunculated subperitoneal tumours, removed by laparotomy; (3) women, keen for children and willing to face the probability of a second major operation, whose uteri were not riddled with little tumours, and whose husbands exhibited spermatozoa numerous and vigorous for hours under conditions of warmth and more than 80 per cent. normal in shape. As to decision for operation, certain survival was not the only consideration. Liability to the after-distresses of abdominal pains and nervous shock were to be weighed. The speaker had studied and published a series of hysterectomies in which the ovaries and tubes were left, and this practice he advocated. *X* rays were giving such striking results in selected cases by Gauss's improved method that, under the limitations laid down by Menge, careful consideration was called for.

Miss LOUISE MCILROY asked Dr. Giles as to his experience of the after-history of cases of myomectomy where injury to the uterine mucous membrane had occurred. In her experience dysmenorrhoea had been experienced in a few cases. She inquired whether Dr. Giles had had any experience of the return of uterine haemorrhage some years after enucleation, and where no secondary tumour growth could be felt bimanually. This had been her experience in one case lately in a young woman operated upon four years ago.

Dr. GILES, in reply, gave the indications for myomectomy: (1) Not more than three or four fibroids. (2) A solitary submucous fibroid; he had on occasion deliberately opened the endometrial cavity, removed a tumour, and closed the cavity. (3) He had successfully removed fibroids on several occasions during pregnancy. He closed the resulting cavity with mattress sutures, and was quite satisfied with the after-effects. He wished for more information on the action of x rays on the degenerative changes in fibroids. Women with small symptomless fibroids did not require operation, and should not be told that they had a fibroid.

GENERAL PERITONITIS DUE TO THE VERMIFORM APPENDIX AND COMPLICATING PREGNANCY.

By T. H. IONIDES, M.B., B.S.Lond., F.R.C.S.Eng.

I BRING this case before you because it is one involving some interesting points in treatment, and I should very much like to hear the views of this Section on the matter. The history of the case is as follows:

A multipara, aged 37, was admitted with a history of pain after food for a long time. She was advised by her doctor to have a gastro-enterostomy done, but as she became pregnant she put it off. She had a sudden acute attack of pain in the abdomen with frequent vomiting, constipation, and no flatus passed; no pain on micturition; temperature 100° F., pulse 126. She looked very ill and was in great pain; the abdomen was distended, extremely hard, and did not move with respiration, which was very shallow; tongue dirty; mouth dry; she was pregnant, from her history, nine months, although the uterus was only the size of a seven months pregnancy. An incision was made in the left rectus; the stomach looked normal, but there was a lot of free fluid. An incision was then made over the appendix, which was found to be perforated and so was removed and the abdomen drained through both incisions.

The patient did well, and by a fortnight the wounds were practically healed.

Labour now came on; the presentation was a breech; the second stage was rapid, and a female child was born, weighing 3¼ lb. The patient immediately collapsed; there was a slight attempt at rallying, but she soon died; there was no *post-partum* haemorrhage to speak of. This occurred early in September, 1911; the weather was very hot, and there was some delay in getting leave for a *post-mortem* examination, and so this was not as satisfactory as it might have been. One found, however, that the adhesions to the uterus had torn off, and that there was a lot of blood in the peritoneal cavity. There was some question of torn intestine, but, owing to the condition of the body, doubt was expressed as to whether this appearance was *ante mortem* or not. I should like to raise the point whether, in cases of late pregnancy complicating general peritonitis and where premature labour does not occur, it is a safe procedure to try and stop labour or whether labour should be induced, and if so by what method. I have only seen one other case, and so I have not much to go on, but I should like to hear from those who have more experience what have been their treatment and results. This patient was very ill, and would not have stood a long operation.

DISCUSSION.

Dr. SCHLIMPERT suggested that pregnancy should be interrupted if this serious state of affairs were met with in late pregnancy. This could be accomplished best by vaginal section, and an appendix operation could be done afterwards. In the earlier months appendicectomy alone was advisable.

CLINICAL TRAVEL.

By ROBERT L. DICKINSON, M.D.,

Brooklyn, New York.

CLINICAL pilgrimages are as old as medicine. Heretofore sporadic and individual, within a very few years systematic visiting of men and institutions by travel in groups has originated simultaneously in several countries, and the practice has made noteworthy strides. The success of these journeyings has led to the formation of a number of new clinical societies, and the drawing power of the older organizations may be yet further weakened from this tendency. It should be worthy of consideration, therefore, whether adaptation of our present machinery cannot obtain many of the same results without duplication of meetings already far too numerous. Three instances may be quoted. The interchange of invitations between the operating rooms of the London hospitals is a departure which one may hope to see widely copied. Paris has long had a central bureau of information. In New York we have recently initiated and systematized the bulletining of clinics, operations, and demonstrations at the Academy of Medicine in the following manner. Of the two bulletin boards, one carries the regular clinic hours of all institutions that have such hours. This list is also printed in some of the journals. The other board schedules, also in large lettering, the notices of operations day by day. These notices are sent in by messenger or telephone to the special attendant, preferably before six the preceding evening. Any one may secure this information without cost, but if notice is desired, by telephone or telegraph, of any particular operation or of work by any particular surgeon, there is a moderate fee in advance. In visiting London one cannot help wishing for such a bureau. It is true that London, Vienna, Berlin, New York, and other cities make provision for post-graduate courses, but what we are now considering is the desirability of regular acquaintance with the practical working of clinics and hospitals at large. Toward this end general societies might allot one or more meetings a year to attendance at clinics or inspection of institutions and to the details of their work and organization. A county medical society could have first-hand cognizance of its public and semi-public medical foundations, and might even recognize a certain moral responsibility for their efficiency—whether it were a hospital or a college or a home. And clinical lectures or demonstration of newer methods of diagnosis, treatment, and operation—not rare, big things, but everyday practical matters—might well become part of the programme of all medical societies.

As a striking testimony of the hunger for this object study and for this training in observation on *post*-post-graduate lines, let me instance the Clinical Congress of Surgeons of North America. It sprang to birth full armed, initiated by Dr. Franklin H. Martin in 1909. Not less than 2,500 men have visited, in each successive November, the surgical and special clinics and the laboratories of Chicago, Philadelphia, and New York. Such an inrush only a great city can welcome; the crowd is too large for close seeing. The importance of this development lies herein: the beginning of the habit of clinical travel is formed, and a man is enabled to select one's future teachers. Also water finds its level quickly in a week like this, for the amount of discrimination is noteworthy.

As to a specialist society, it can readily make the tour in a reasonable time, of all the institutions working in its own and in allied fields in its neighbourhood, and study clinical work as well as efficiency of administration. Such a visit should not be deemed barren of result if a subsequent vocal meeting of the society fails to bring forth real frankness in discussion of the visit by members detailed to report. The effect on visitor and visited is, nevertheless, very searching. For such a society the next step is the visit to neighbouring cities, and specialist societies are not too large for this, say one or two days in a year.

It was intimated that a man should be seen in his own workshop. If I were to ask you to come before this Section to explain how it is that your benches are overflowing or your operating staff has perfected such team-play, you will pick out your own data and what seem to you explanations, but if I go and see your machinery at work I will find my own omissions and blunders, on which you may never touch. Moreover, I am getting training in the art of observation. With practice this mental sieve strains finer and finer, and one selects and compares more surely, more swiftly.

Provided such opportunities are well worked out, is there a field for the travelling clinical club? As to the need. How often does a busy man visit other clinics? Does he do it systemically? Is it the hard-pressed surgeon from the great city who sees others at work, or is it only the younger men who travel? Perhaps it will be good for our souls openly to confess that heretofore we of New York have actually seen too little of men in institutions other than those in which we hold appointments. The American Gynaecological Club asked, after a visit to Pittsburg, why there should prevail in that city of twelve new hospitals in seven years an average of technical performance and resource and judgement unusually high and even, combined with an entire absence of the perpendicular pronoun? The answer seemed to be because it was the habit of these men to visit clinics at home and to go to those in other places three times a year.

Is there any one of us in a rut? Is there any man satisfied with his results? Is there any man too driven to do quiet thinking? Or is any prone to be carried away by the sweeping claims of novelty? If any of these, then he needs travel, and travel with other men; for clinical travel interspersed with much sight-seeing and the piloting of a family is with a divided mind. Although one may thus come upon more average performances and a stage not set, yet, on the other hand, a programme prearranged for a group furnishes condensed, selected experiences with far wider prospect, and, best feature of all, attrition and illuminating informal discussion. Certain details of such organization, loose as it purposely is, may be jotted down.

The members must have like interests. They should be of one line of practice, or of one nearly allied. Diverse interests gave scattered and vague direction to a recent exodus. The group should be small. Thirty with an attendance of twenty has worked well. The large group straggles, cannot see, cannot be intimate. Membership may include, with advantage, variety of type—the library man with the pure handicraftsman—but it may not take in the unclubbable man, because the contacts are very close. To take in only half a given feud is, of course, to deprive the club of some strong men. The irreconcilable or blatant individual is necessarily outlawed by a close vote. The age limit has been worked out in this way—that men over 55 show little inclination to see new work. As they come into range of 50 or 55 (as variously regulated in different clubs), members are automatically "promoted" to "honorary" membership, welcome but not active. There are also very successful groups of men younger than the 40 to 50 group. The measure of a candidate would be, however, experience and service rather than age. As guests such a society has invited one or two men of allied interests. The clinical surgeons did this when a genito-urinary surgeon and a gynaecologist made the English tour with them. The conditions are well stated in a letter from a member of your own Gynaecological Visiting Society.

> The society is a purely informal one. We have no records or minutes, no president or committee, and never publish any proceedings. The only conditions for membership are:
>
> 1. Age of retiring from society 50, which secures us a society from the more obvious results of arterio-sclerosis.
> 2. A gynaecological or obstetrical hospital appointment in Great Britain.
> 3. Membership is restricted to thirty men.
> 4. Members of a group section (say Liverpool, Birmingham, or London) must be prepared to welcome once a year the other members at their hospital for demonstrations of technique, reading communications, and the free discussion of new ideas and work by the society.
> 5. Three to four annual meetings in the United Kingdom.
> 6. Personal election, which secures the absence of disturbing personalities.
>
> The fact that there are no minutes enables us to say exactly what we think of one another and in as forcible language as we like, and strange to say we all remain intimate friends, prepared to recognize that a lot of our associates do things better than ourselves. The result is a unique spirit of camaraderie, which is, I think, our strongest asset. I can only say that in British gynaecology there has been, up to the last ten years, a most poisonous spirit of jealousy, suspicion, and veiled contempt (very thinly veiled at times) amongst the seniors of the profession. No man could recognize that his fellow's technique was better than his own. The possibility of a senior man going to see another senior man operating was undreamt of, with the result that many of the larger gynaecological schools were fast becoming intensely parochial in their practice, and I know no place where that danger was more threatening than in London. Now that spirit we have set out to kill, and I think we have already effectively scotched it; we consider ourselves the gynaecologists who will be most naturally in the van within a few years, and hope by that time to have completely leavened our section of the profession. There is, in addition, an element of mild Bohemianism about us which prevents us taking ourselves too seriously, and which comes to the top at the dinner we hold at every meeting. We were founded about three years ago, and have already had visits to our friends at Liverpool, Glasgow, Edinburgh, and London. Eight weeks ago we arranged a most successful trip to Paris, and are going to Berlin next May. I wonder if I have succeeded in conveying to you something of the spirit of the little society which has taught me more than anything I know, and convinced me that there are men without a good many of my opportunities who can do things better, more neatly, and more quickly than myself. In my own view I am quite convinced that our success lies in our informality. There is so much one is prevented from saying or criticizing at formal societies—which tend to develop pomposity in the speaker.

Is there a need of international travel? Emphatically yes. The difference of practice being greater starts more thinking, and longer duration permits thinking that is more sequent and to the purpose. The field looked over is larger, the generalizations are wider. One man travelling alone can hardly bring back from abroad a nation's best and spread it generally in his own country, but a picked group may. A group will carry weight with a visited nation that no lone opinion can. Also it is found that more men will go to visit a number of clinics afar, for their ties on a nearer round call them back and interrupt this study. On distant travel half-day clinics covering two or three weeks may well exhaust the capacity for sustained attention. In such travel the programme should be made out in detail many months ahead, selecting for especial attention the best teachers, equipment, hospitals, museums, laboratories, operators, book stores, instrument houses; the recent literature should be excerpted. There need be no papers, and there should be none but simple functions, preferably at a joint charge. As to publications of a report, no agreement of opinion is found. Either a bare outline of clinics and cases could be issued; or only praiseworthy matters touched upon; or, thirdly, full and frank observations without comment might be privately printed, and from these he who read might run to his own conclusions. Whether any of this is undertaken or not, the total amount of information gathered is so varied, and one's memories run into such a kaleidoscope, that notes should be made, particularly of the details of methods which one is eager to carry home.

It is a safe thing to say that when the habit of travel becomes general the provincialism of the big town will die, and our smug self-satisfaction receive its quietus. The important outcome of these experiences lies in a heightened and discriminative mutual regard together with an overhauling and practical review of one's mental storehouse and craftsmanship that may prove to be the strongest stimulus of years—perhaps of a lifetime.

As an example of what may be done in so short a space as four years to secure a birdseye view of a speciality, I ask your indulgence for the following imperfect outline. Your Visiting Gynaecological Society has travelled in British and Continental cities. The New York Obstetrical Society has visited almost all of the important clinics of its own city and of Philadelphia. Our national society gave to the operating room of Kelly and Cullen one of its three days in Baltimore at the annual meeting. Each year for a week or more visitors at the Clinical Congress have been welcomed at every hospital and college of each of our three greatest cities in succession. For three weeks, last July, twenty-five members of the American Gynaecological Club went about among the institutions of six German cities, and of Amsterdam and Vienna. The spirit was the spirit of appreciation, and the enthusiasm and profit and the stirring of ideas

were very marked. We hope in July, 1914, to be able to cross the ocean again, and to look forward in our department to that increased heartiness and personal friendship among gynaecologists and obstetricians which have linked together the surgical profession of England and the United States since the visit of our "Clinical Surgeons" to this country two years ago. In the following year (September, 1915) we expect to tender a most cordial welcome to very many of you at the International Congress of Gynaecology and Obstetrics in New York, and at series of clinics across the continent to the Panama Exposition in San Francisco.

THE SIGNIFICANCE OF THE WASSERMANN REACTION IN GYNAECOLOGICAL DIAGNOSIS, WITH SPECIAL REFERENCE TO UTERINE HAEMORRHAGE.

By A. LOUISE MCILROY, H. FERGUSON WATSON, and J. HAMILTON MCILROY.

(From the University Gynaecological Clinic, Royal Infirmary (Professor Munro Kerr), and the Pathological Laboratories of the Western and Royal Infirmaries, Glasgow.)*

THE Wasserman serum test for syphilis has proved itself to be of importance in the diagnosis of many pathological conditions, and it occurred to us that an investigation into the prevalence of syphilis among gynaecological patients would be of value, not only from the point of view of diagnosis and treatment, but also in so far as it might add to our knowledge of the conditions concerned in infant mortality.

For our investigation we took 100 cases, mainly from the out-patient department. These patients, whilst not selected from the point of view of the probable result of the Wassermann test, in every case suffered from definite gynaecological complaint, accompanied by more or less serious disturbance of the general health. Only 6 patients gave a history which pointed to syphilitic infection in the past, and in these the Wassermann reaction was positive. The patients attending the clinic are drawn chiefly from the respectable working classes, all cases of obvious syphilis being excluded and sent elsewhere for treatment.

The method used by us (H. F. W. and J. H. McI.) for the Wassermann test was that of Browning, Cruikshank, and Mackenzie.

The accompanying tables show the main general features, with the result of the Wassermann test.

An investigation of the serum of seven families belonging to negative mothers was made, and in every case examined the reaction was found to be positive. Those patients classified as "doubtful" include several in which the reaction was very weakly positive, but we were careful in classifying as positive only those cases in which the reaction was quite definite. In collating the results we were much surprised at the proportion of cases with a positive reaction. From this investigation it would appear that there is an amazing prevalence of latent syphilis in gynaecological patients, and that the patients do not display the classical symptoms of the disease.

We are fully aware that so considerable a proportion of positive results in this class of cases may raise doubt as to the reliability of the Wassermann reaction in the minds of those who are unacquainted with the method of the test. Accordingly it is of importance to detail here the results of the examination of a series of healthy children carried out at the same time as the investigation of the gynaecological cases mentioned above. Thus one of us (H. F. W.), in the course of work on the prevalence of syphilis in town children, examined by way of control 69 country children coming from thirty-nine families living in a district of Ayrshire. There was no suspicious circumstance in either the personal or the family histories of these children, and they all without exception reacted negatively to the Wassermann test. Thus it is perfectly clear that a positive reaction does not occur at haphazard, and the specificity of the Wassermann test for syphilis has been universally recognized by investigators. It must be here stated that the present publication is in the nature of a preliminary communication, as the investigation is being continued and further extended, more especially with regard to the nature of the gynaecological diseases and also to the presence of syphilis in the offspring. The form of treatment used was the administration of mercury and arsenic by the mouth. The result of this treatment in the positive cases was markedly beneficial.

The Diagnosis in Cases of Uterine Haemorrhage.—It has been the experience of most gynaecologists that there is much difficulty in the diagnosis and treatment of certain cases associated with menorrhagia or metrorrhagia occurring about the menopause, or after menstruation has become established at puberty. In the former class of patients the question of neoplasm of the uterus is at once considered, and if this can be excluded the diagnosis of metritis or fibrosis is made, provided that the clinical investigation indicates the uterus alone as the cause of the symptoms. In such cases we must trace the condition to its origin in the failure of function on the part of the internal secretory organs or to some change classified under the heading of toxaemia. Many of the patients investigated suffered from increased amount of menstrual flow, and the diagnosis of metritis was frequently made. Our results show that in cases in which uterine haemorrhage,

TABLE I.

Number of cases examined	... 100
Clinical history of syphilitic infection ...	... 6
Positives (married 34, unmarried 9) ...	... 43
Negatives (married 48, unmarried 0) ...	... 48
Doubtfuls (married 9, unmarried 0) ...	... 9

TABLE II.

General Diagnosis.	Number Affected.	Result of Wassermann Reaction. Age Groups.		
		Under 25 Years.	25 to 40.	40 and Upwards.
Metritis	24	Positive	Positive 10 Negative 6 (one had + child) Doubtful 1	Positive 5* Negative 1
Uterine haemorrhage	13	Positive 1 Negative 3 (one had + child)	Positive 3 Negative 3 Doubtful 2	Negative 1
Uterine displacement	13	Positive 1	Positive 3 Negative 5 (one had + child)	Positive 1 Negative 2 (both had + children) Doubtful 1
Leucorrhoea and constipation	23	Positive 2* (one was suspected) Negative 2	Positive 3 Negative 9 (two had + children) Doubtful 2	Positive 2* (one was suspected) Negative 3
Dysuria	8	Positive 1* Negative 1 Doubtful 1	Negative 4	
Anaemia with headache	5	Negative 2	Positive 1 Negative 1	Positive 1
Adnexal conditions	5	Positive 1	Positive 1 Negative 1 Doubtful 1	Negative 1
Fibroids	3		Positive 1* Negative 2	
Pregnancy with unusual complications	3		Positive 1 Negative 1	Positive 1
Congenital malformation of uterus with mental deficiency	1	Positive 1*		
Menstrual epilepsy	1		Doubtful 1	
Acute puerperal mastitis	1	Positive 1		
Total... ...	100	Positives 10 Negatives 8 Doubtfuls 1	Positives 23 Negatives 32 Doubtfuls 7	Positives 10 Negatives 8 Doubtfuls 1

NOTE.—Those marked * are the six cases in which there was a history suggestive of syphilitic infection.

* The expenses of this research were defrayed by a grant from the Carnegie Trust.

apart from tumour, is the principal feature, syphilis very frequently is present. After treatment by antispecific remedies many of the patients stated that the menstrual flow was less copious in amount, and that the headaches were much less distressing. Some of these patients had been treated previously without any success by the ordinary gynaecological methods. Indeed it was this failure on the part of many patients to respond to treatment by curettage, etc., that led us to take up the investigation of toxaemia in its relationship to gynaecological affections, and consider the treatment upon broader lines than merely operative measures.

Minor symptoms, such as digestive disturbances and moderate leucorrhoea, were of frequent occurrence, but were present among the negative cases also, so that no deduction can be drawn from these.

Some of the younger unmarried patients giving a positive reaction were of special interest, and, as an example, we quote one, a girl aged 13, who had profuse irregular menstruation for a year with dysmenorrhoea. She was the eldest of five, two of whom were "delicate." Improvement was very marked after treatment. In another case, that of a girl aged 19 years, somewhat physically and mentally defective, and suffering from irregular menstruation, the pelvic organs were found to be infantile. When she was put on treatment for syphilis, and at the same time given thyroid extract, the improvement was pronounced. Such a case is as a rule classified as a ductless gland aberration, and it may be said that the thyroid extract caused the improvement. This to a certain extent we allow, but at the same time it is felt that the presence of a definite transmitted congenital poison has had some deterrent effect upon the function of the internal secretory organs themselves.

Syphilis and Fertility.—The examination of our series of cases showed that there was no case of sterility among the positive married patients. Whilst it is unfair to generalize from the examination of 100 cases, it may be mentioned in confirmation that one of us (H. F. W.) found that there was marked fertility in a family where both father and mother gave positive reactions.[1] We can, therefore, suggest that the presence of active syphilis is no bar to fertilization and the birth of viable children. It was noted on inquiry that a greater proportion of the children of positive mothers were described as "delicate" than that of the negative mothers. On this point we cannot make any clear statement until we have continued our investigations further into the serum reaction of the offspring. Although in only two of the cases was there definite clinical evidence of syphilis in the children, we feel confident that congenital specific disease plays a large part in the derangements of fetal metabolism with their effect upon the future well-being of the child. The obvious conclusion to be drawn from the point of view of those interested in the subject of fetal and infantile mortality is that it is our duty as medical practitioners to enforce some measure of reform in the way of a thorough investigation into the prevalence of syphilis—latent as well as active—among the community, and consider a scheme of notification, having as its ultimate object the eradication of the disease. The subject is beset with many difficulties, but when there is a realization of the enormous amount of congenital syphilis, apart even from acquired cases, there will be an awakening as to the importance of its effect upon the development and well-being of the race.

In conclusion, we would urge that in cases of gynaecological ailments, especially of the type associated with uterine haemorrhage, syphilis very frequently is present. Wherever there is metrorrhagia or menorrhagia, apart from obvious cause, such as tumour, syphilis should be suspected. Evidence of syphilis in the form of classical signs often cannot be detected in such patients, but the existence of the disease is shown by the Wassermann reaction.

[*Note.*—Since writing the above a patient was seen by one of us (A. L. McI.) in consultation, with a view to the operative treatment of severe metrorrhagia occurring at the menopause which had not improved to any marked extent under the usual methods of treatment. On examination the uterus was found to be enlarged and hard in consistence. The diagnosis of metritis and malignant disease was discussed; but, before coming to a definite decision as to the diagnosis, the Wassermann test was applied. The reaction was markedly positive, although there was no clinical evidence which might lead to the suspicion of the presence of syphilis or its history.]

REFERENCE.
[1] Watson, BRITISH MEDICAL JOURNAL, vol. i, 1913, p. 877.

DISCUSSION.

Dr. SCHLIMPERT asked for details of the technique and of the antigen employed. He was greatly surprised at the very high percentage of positive results. The reaction had been done at Dresden on the blood of 400 cases *post mortem* with only 10 per cent. of positive results. The test in each case was done before *post-mortem* changes could have had time to affect the result. He was of opinion that the test might be very useful before delivery in maternity cases, as it would put the practitioner on his guard.

Mr. BECKWITH WHITEHOUSE (Birmingham) wished to thank Miss McIlroy for her important paper. He would like to know the technique of the Wassermann test employed, since to him 50 per cent. of positive cases in all patients examined appeared extraordinarily high. Scotland must be a terrible place! He was much interested in the speaker's remarks about fibrosis and metritis. He also had been conducting experiments upon this subject, the results of which he intended to bring forward in a Hunterian Lecture next year. All he wished now was to emphasize the fact that his research so far tended to prove that a certain proportion of cases classed as fibrosis uteri or metritis was syphilitic in origin. The fibrosis was secondary to degeneration supervening upon syphilitic endarteritis.

Dr. ARCHIBALD LEITCH (London) also asked for the details of the method used, because it seemed to him that the percentage was very high. He doubted results obtained from *post-mortem* cases and considered that even 5 per cent. positive in an average population might be an overestimate.

Miss MARTINDALE (Brighton) asked Miss McIlroy why she advocated notification of syphilis. It seemed to the speaker the only use of notification was: (1) The enforced isolation of the patient (an obviously impossible procedure, as the length of time of isolation would be so long). (2) The enforced treatment. Again, in those countries in which notification had been introduced, as in Sweden, the law had proved itself a dead letter, the doctors refusing to notify, or the patients to submit to it.

Miss MCILROY, in reply, stated that the method used was the Browning-Mackenzie method, lecithin-cholesterol being used as antigen. The Wassermann reaction would be of enormous value as a routine in obstetrical cases by clearing up many cases of toxaemia. In fibrosis and metritis much information might be gained. In reply to Dr. Martindale, she indicated that her idea of notification was to confine it to the medical profession only as a means of estimating the prevalence of syphilis in the community, and therefore the adoption of means for its treatment. As a system of control exercised by other countries it was of little use; some other and better method would have to be employed, but in a discussion such as this there was no time for details of discussion upon this question.

ABDERHALDEN'S SERUM REACTION OF PREGNANCY.

By Dr. HANS SCHLIMPERT,
Freiburg.

ALLOW me first to give you the theory of Abderhalden's reaction in pregnancy. If albumin be taken into the alimentary canal, it is broken up, by the action of the epithelial cells, into the lower albuminoid bodies—peptones, polypeptids, and amino-acids. In these forms, and particularly the last of these, the albumin is absorbed and carried by the blood to the various organs, where it is again synthetized into complicated albumin. If albumin be injected directly into the circulation without the intervention of the intestine, proteolytic ferments are produced in the blood in an endeavour to break the albumin down,

as occurs in the normal metabolism. These ferments are produced either against a foreign albumin or a homologous one, such as an animal's own muscular tissue. Largely to Abderhalden and his pupils do we owe our knowledge of these processes.

Next, Abderhalden went on to prove his theories in human physiology, and chose pregnancy as being an easily controlled condition. Schmorl's observations have made it certain that chorionic villi enter the maternal blood in some cases of pregnancy, but there is in every case of pregnancy a complicated protein metabolism and a communication between the maternal and fetal circulations so close that albumin molecules far short of cleavage to amino-acids may pass from the placenta into the maternal blood. Therefore it was to be expected that in the maternal blood proteolytic ferments existed against placental albumin.

This Abderhalden found to be true to a degree that enabled him to demonstrate, by the presence of the ferments, the existence of pregnancy. He evolved three methods:

1. The so-called optical method.
2. The dialysation method, with the biuret reaction as an indicator.
3. The dialysation method with ninhydrin as an indicator.

The first two are rather more complicated than the ninhydrin method, which is now adopted generally. The results obtained are, at present, a matter of contention.

Technique.—Four components are necessary: (1) The blood to be tested; (2) the dialysing tubes and the flasks to hold them; (3) placental tissue coagulated by boiling; (4) ninhydrin (chemically triketohydrindenhydrate).

The blood serum should be obtained if possible before breakfast, because even after the not very substantial German breakfast a quantity of amino-acids will be present in the blood, and may interfere with the reaction. There must be absolutely no haemolysis, as thereby intracellular ferments would be liberated. The dialysing tube must be tested very carefully beforehand. Ninhydrin is a stain which reacts with all albuminoid bodies, including amino-acids, to give a bluish-violet colour after boiling. The preparation of the coagulated placenta is difficult; it must be blood-free to eliminate serum albumin, and must be boiled in small pieces till all amino-acids are either destroyed or washed out—that is, as tested with ninhydrin.

Experiment.—In one tube is placed pregnant serum *plus* placental tissue; the mixture is surrounded by water in a flask, and placed in the incubator for sixteen hours. By the action of the pregnant serum on the placental albumin peptones and amino-acids are formed, and dialyze into the surrounding water, where they may be tested for with ninhydrin; a *bluish-violet*, that is to say a *positive colour*, results.

Now take the case of the serum of a non-pregnant woman or a man; place serum *plus* placenta in the tube. There are now no ferments acting on the albumin of the placenta, therefore no amino-acids and other dialyzing substances are formed; the albumin of the placental tissue remains unaltered, and nothing dialyses through the walls of the tube. If you now boil the water with ninhydrin, no colouring results—that is, the reaction is negative.

We should be very fortunate if the technique were as simple as my description would indicate. As a matter of fact, it is full of pitfalls, and Abderhalden himself has admitted this. I am especially indebted to my colleague, Dr. Hendry of Glasgow, who did most of the work with us and helped to discover some important faults of technique, thus gradually developing the method still further. It is not possible to deal with all the details of technique in this short paper, and I hasten to give you our results. We examined both animal and human serums. With animals we examined horse serum reacting with horse placenta and sheep serum reacting with sheep placenta. In addition, we reacted sheep serum with horse placenta and human placenta, and horse serum with sheep placenta and human placenta.

We got horse blood and placenta from some horse breeders, and the placenta of the sheep from the slaughter-house. We had thus absolute certainty in our controls. In all we examined 78 cases of pregnant and non-pregnant animals, with only one failure, and this probably due to a fault of technique. The blood of an innocent male sheep reacted positively! With the exception of this doubtful case every reaction proved accurate.

Now, as to our results with human serum and human placenta. In a first series of 237 cases done nearly ten months ago, we had many failures, especially positive reactions with non-pregnant cases. However, with better technique, especially additional controls, our results have improved, for we have had a second series, of 79 cases, without a failure. Lately we have gone further and examined certain pathological conditions, such as carcinoma, fever cases, etc., in non-pregnant cases. This we did because certain workers have observed positive results regularly in such cases. We cannot altogether bear out these workers, although in some of them we did get positive reactions. This, however, we believe to be due to the summation of amino-acids in the serum and some still present in the placenta, neither of these alone being sufficient to react with the indicator. With Abderhalden's latest technique, we have lately had accurate results in these cases also.

To sum up, it may be stated that:

1. An exact diagnosis of pregnancy can be made in animals (horses and sheep).
2. The same is true for *normal* pregnancy in women.
3. In cases of carcinoma and fever the reaction may be doubtful, but this result is more likely to be due to a defect of technique than to the formation of non-specific ferments.

DISCUSSION.

Dr. HENDRY (Glasgow University) dealt with some details of technique. The best dialysing tubes were those of the Halle firm, which provided material for Professor Abderhalden's Institute. Tubes should be used for any one experiment which gave the same density of reaction with the preliminary tests with ninhydrin. Salt solution was better than tap water for washing the blood from the pieces of placenta. The coagulated placenta must be proved absolutely peptone-free by a very strict test, namely, 1 c.cm. of a 1 per cent. solution of ninhydrin to 5 c.cm. of dialysate. Ninhydrin was a very delicate reagent, and, by the summation of peptones and amino-acids in the serum, *plus* the placenta, might give a positive reaction where each alone was negative. The serum must be absolutely fresh, as, when stale, the ammonia formed would give a rose-red colour with the indicator. Abderhalden had decided that cases of eclampsia giving a negative reaction had a worse prognosis than those showing a positive.

Dr. ARCHIBALD LEITCH (London) congratulated Dr. Schlimpert on the excellent exposition of Abderhalden's method, as he had come to Brighton specially to listen to it. Serological methods suggested for the diagnosis of pregnancy hitherto had been very unreliable; but, judging from the consensus of opinion of German workers and from his own limited experience, he thought the method of Abderhalden was of very considerable value in the diagnosis of early or obscure cases. Most of the fallacies had been dealt with by Dr. Schlimpert, and he was glad that the speaker did not subscribe to the dictum of certain experimenters that the reaction was infallible. He pointed out certain additional fallacies that ought to be taken into account before giving an opinion on the result. If one tested the latest dialysation tubes recommended with a certain solution of Witté's pepton, it would be found that the colour reactions of the dialysate given with ninhydrin varied enormously. This was important, because in the performance of the reaction one compared colour tints. Thus, if one by chance used a tube of slow diffusion rate for the placenta *plus* serum, and one of greater dialysability for the serum control, it might happen that a pregnant serum would be negative and a non-pregnant serum would be positive. Normal serums, too, might contain considerable quantities of dialysable substances, such as amino-acids, that would give a positive reaction. The former fallacy could be got over by duplicating or triplicating the tests, and the latter by previous dialysating against running water. He had put the method to practical test and thought very highly of it in the diagnosis of early pregnancy, but it was not strictly specific.

Dr. Leith Murray (Liverpool) had listened with great interest to the description of technique given by Drs. Schlimpert and Hendry. He had had considerable experience of the method for certain conditions other than pregnancy, and as the result of the almost weekly improvements in technique that had appeared, found himself in the unpleasant position of having to discard all but his latest results. He had found that less than half of the dialytic thimbles (579A, Schleicher and Schüll) were satisfactory, and recommended that they be tested with strong egg-albumin and pepton. He emphasized the necessity for complete aseptic technique throughout, and advised that excess of toluol be laid on the surface. The coagulated material must be tested with a very strong solution of ninhydrin on the day of the experiment. He had had considerable difficulty in obtaining blood absolutely haemoglobin-free, and asked for information on the point. He doubted whether the reaction was so absolutely specific as had been stated, for lately Williams and Pearce had shown that uterine wall at term, and occasionally kidney, would react with pregnant serum. With so many pitfalls any simplification of technique was advisable; and he called attention to the method of the above-mentioned workers who dispensed with the dialysation thimbles altogether. They pointed out that as the bodies to be tested for were incoagulable, the process could be performed in an ordinary test tube, thereafter the contents diluted to a certain volume with water, boiled after the addition of acetic acid, filtered, and if necessary refiltered, after again boiling. The filtrate was tested in the ordinary way with ninhydrin (0.2 c.cm. of a 1 per cent. solution to 10 c.cm. of filtrate).

Dr. Schlimpert, in reply, reiterated several points in his technique, especially with regard to the testing of the coagulated placental tissue. He recommended the dialytic tubes obtainable from Schöps of Halle. In reply to Dr. Leith Murray, he recommended that the blood after withdrawal be placed in an ice chest for four hours; the serum could then be decanted and centrifugalized.

SECTION OF DERMATOLOGY.

J. H. Sequeira, M.D., F.R.C.P., President.

TREATMENT OF CUTANEOUS TUBERCULOSIS BY MEANS OF COPPER.

By G. Norman Meachen, M.D., B.S.Lond., M.R.C.P.Lond. and Edin.,

Physician to the Blackfriars Skin Hospital and in Charge of the Skin Department, Prince of Wales's General Hospital.

The therapeutics of the various salts of copper, more especially the sulphate and the chloride, may be stated briefly to lie in their antiseptic, astringent, and caustic properties. Thus, weak solutions of copper sulphate (1 in 5,000,000) have been employed for purifying water. Blue vitriol has long enjoyed a reputation as a mild caustic, causing less pain than silver nitrate. The oleate of copper had, at one time, considerable vogue as an antiparasitic in the treatment of ringworm. Levi and Barduzzi (quoted by Ringer and Sainsbury) state that small doses of copper sulphate promote assimilation and act like arsenic (as an alterative), being useful in eczema, scrofula, and tuberculosis.

The action of copper in the colloid state upon the blood has been demonstrated by MM. Chabanier and Rollin, who showed that the red cells and the haemoglobin are at first slightly diminished, gradually regaining the normal amount. The number of leucocytes diminished immediately after the injection, returning after fifteen days to the normal. The polynuclear and large mononuclear leucocytes are increased in number.

As far back as 1894 the phosphate and the acetate of copper were employed in tuberculosis by two Frenchmen—Luton, father and son. In 1906 the use of copper alginate was recommended by Drs. A. and G. Gresswell, of Louth, in doses of $\frac{1}{24}$ to $\frac{1}{6}$ grain as a remedy for tuberculous enteritis and lupus.

With the advent of chemotherapy it is only natural that researches should be made into the value of metallic salts both in internal and external tuberculosis. The experiments of von Linden (Bonn), Professor Meissen (Hohennef), and A. Strauss (Barmen), into the specific action of salts of copper in tuberculosis were reported upon at the Tuberculosis Congress at Rome, April, 1912. These observers found that in guinea-pigs the tubercle bacillus is stained by methylene blue and by solutions of copper chloride and tartrate, while *in vitro* these same agents in a 1 per cent. solution kill the bacilli in twenty-four hours, so that animals, when infected by them do not become diseased. In tuberculous animals treated with copper the nodules of miliary tuberculosis appear in the lung as brownish-coloured spots which, under the microscope, contain brown granules and brown bacilli-like bodies. When moistened with ammonia the intense blue colour which results shows that traces of copper salts have become deposited in the tubercle.

A combination of copper with lecithin, according to von Linden, enables large doses to be introduced into the body without injury. Such a compound is prepared by the Bayer Farbenfabriken, and may also be employed locally as an ointment. "Borcholin" is a similar preparation prepared by the Vereinigten Chemischer Werke, Charlottenburg. Potassium tartrate was added by Strauss as an electrolyte in watery solution. Lupus nodules may also be painted with copper potassium tartrate dissolved in traumaticin. Some degree of local reaction occurs, but the lupus nodules pale and flatten without exudation or tumefaction. Strauss's technique consisted of the injection, subcutaneously or intravenously, of iodine-methylene-blue, two to three parts per thousand, in a 6 per cent. solution of common salt, in doses of 3 to 10 c.cm. Simultaneously with this, or alternately, copper salts, such as the chloride or the potassium tartrate, may be given, or, better still, a chemical combination of the dye with copper and lecithin, which preparation is said to have a greater lipoid solvent effect. A preliminary freezing of the nodules with the carbonic acid snow, to expose the cutis, prepares the ground for the copper treatment.

Internally, copper chloride may be given as well in capsules containing 0.01 gram, one ter in die. Luton states that when copper is given internally milk or Vichy water or a menthol pastille should be given at the same time. He recommends a pill of acetate of copper, 1 cg. for a dose.

Although the time is too short to draw any sound conclusions as to the result of chemotherapy in lupus vulgaris by means of copper salts, I should like to say that I think Strauss's method may prove to be a valuable adjunct to our armamentarium for the treatment of cutaneous tuberculosis. I have used the copper chloride for hypodermic injection directly into the lupoid tissue, employing for the purpose $\frac{1}{2}$ c.cm. to 2 c.cm. of a 1 per cent. solution in water. At the same time I give cachets of the same salt in one-sixth grain doses three times a day. The nodules are turned slightly white for a short time after the injection, but some erythema follows and a little local swelling. In two or three days time the lesions look somewhat paler and flatter. I have also bathed the patches with ordinary Fehling's solution, and in one case of lupus cavi nasi, in which I had previously employed Pfannenstill's method, I directed this solution to be gently syringed up twice a day, a weak ointment of boric acid being used to calm any irritation.

I have not yet had time to speak as to the effects of the lecithin compound. In view of the fact that the copper treatment is clean, non-toxic, and is particularly suitable for ambulatory treatment, I beg to commend it for the consideration of my colleagues as being worthy of a more extended trial.

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THE TREATMENT OF SKIN AFFECTIONS BY SOLID CARBON DIOXIDE.

By J. L. BUNCH, M.D., D.Sc., M.R.C.P., B.S.,

Physician for Diseases of the Skin to the Queen's Hospital for Children, London; Physician to the Skin Hospital, Leicester Square; Membre Correspondant de la Société Française de Dermatologie.

THE use of solid carbon dioxide in the treatment of many affections of the skin has now become well established, and there is no question that some skin diseases can be more satisfactorily and more rapidly cured by freezing than by any other method of treatment at our disposal. Solid carbon dioxide has a larger field of usefulness in the treatment of angiomata, pigmentary, stellate, and other varieties of naevi than in other skin diseases, chiefly because naevi are so very common and also because they occur so frequently in children, and in children a method which is extremely rapid and almost painless is of the utmost value.

I have treated naevi in babies only a day or two old, and in most cases the few seconds' application of the snow is completed and the child is on its way out of the room before it has had time to cry, if cry it will, and older children rarely seem to feel any definite pain while the carbon dioxide is being applied, although there is usually some burning or tingling while the frozen surface is thawing again afterwards.

At the meeting of the British Medical Association last year I read a paper on two thousand naevi which I had treated by the application of solid carbon dioxide, quite aside from other methods of treatment, and I have treated a large number of naevi since. Apart from the rapidity and comparative painlessness of the method, one great advantage is the ability to cut or mould the stick of snow to any shape, so that a naevus of reasonable size, whatever its irregularity of outline, can be accurately frozen in its whole surface at a single application—a result which cannot, of course, be obtained by such methods as electrolysis, the cautery, or radium. A single application is usually sufficient to cure a stellate naevus or small angioma if care is taken to shape the stick of snow accurately to fit, including a margin of healthy skin of one or two millimetres all round, and exercising firm pressure on the skin.

Pigmentary naevi, especially if they are hairy, usually need more than one application, and it is much better to do too little at one sitting than too much, as I have seen quite unsightly scars, sometimes keloidal, produced by a too prolonged application of the snow to moles, the scar being often to all intents and purposes as disfiguring as the original skin lesion. When the hairs on the mole are coarse I prefer to remove them by electrolysis, and the subsequent return of any pigment in the naevus can be obviated by giving radium applications while the skin is healing up from the carbon snow treatment.

In the case of naevo-fibromata and naevo-lipomata, where excision is objected to, a great deal of disfigurement can be removed by treating the purplish skin areas with carbon dioxide until the surface is white, and then inserting some electrolysis needles, insulated with shellac to within half an inch or an inch of the point, right into the swelling, and repeating this procedure if necessary at different points of the swelling.

Port-wine stains are undoubtedly the most unsatisfactory kind of naevus to treat by any method, and one sees cases the colour of which is so intense and which involves the deeper structures to such an extent that no method at present at our disposal is capable of doing more than diminish the disfigurement without running the danger of unsightly scarring. The most difficult cases to treat are those in which the corium and underlying structures are deeply involved, and which have a nodular, irregular surface with warty projections, and for these there is no really efficient method of treatment. But for a moderate-sized, red, superficial port-wine stain in a child, where the purple tint is absent or but slightly marked, applications of solid carbon dioxide at intervals of a fortnight or three weeks will often give excellent results. In adults, too, I have been quite successful when the port-wine stain was fairly localized and carbon snow was employed in conjunction with a plaque of radium of one million activity. In these cases the radium was first applied to the areas which showed the darkest tint. When the colour had been eliminated, or markedly diminished, from these areas, applications of solid carbon dioxide were commenced, and the final results were quite good. Of course this method of treatment demands some patience both on the part of the dermatologist and the person under treatment; but from the patient's point of view I gather that the somewhat prolonged treatment is quite worth while.

Cases of linear naevus and naevus verrucosus also do very well when treated with solid carbon dioxide, but for verrucose naevi where there is much thickening and warty growth very firm pressure must be made, and the pressure maintained for about sixty seconds or even more.

In all these cases I consider that the stick or crayon of solid carbon dioxide is far preferable to any other method of applying carbon snow. At one time I tried a method of dipping the stick or crayon into ether before applying it to the naevus, with the idea of obtaining a greater intensity of cold, and so diminishing the length of the application, but it has been clearly shown that the analogy of a mixture of snow and salt does not hold in the case of carbon snow and ether, and no lowering of temperature is obtained by this means. This also applies to the method of dissolving carbon snow in ether, and painting on the mixture with a camel's hair brush. This latter method is, however, useful in some cases of lupus erythematosus, when a considerable area has to be covered, and diminution of vascularity, rather than any deep action, is of importance, but the painting has to be repeated so frequently that the inconvenience to the patient more than outweighs any slight advantage in the initial saving of time. This method of treatment was first initiated in America, and has now been practically given up there.

When a much greater intensity of cold is required than that obtainable with solid carbon dioxide, or a large surface has to be covered in the minimum of time, it is often convenient to use liquid air. The temperature of solid carbon dioxide is only — 78.2° C., while that of liquid air is — 190° C., so that with the latter reagent the freezing is much more rapid. There is little appreciable difference in the nature of the inflammatory reaction produced by liquid air and solid carbon dioxide, but liquid air has a much more powerful action. In the liquid state air occupies $\frac{1}{800}$ part of its ordinary volume; in other words, if liquid air be vaporized it will expand 800 times, and as the more volatile nitrogen evaporates the temperature rises, and the almost colourless liquid assumes a bluish tint—the colour of liquid oxygen—which remains until all the liquid has vaporized. Liquid air can be best applied on a swab of absorbent cotton, and its action can be regulated both by the time of application and the amount of pressure employed. It is rarely necessary to apply it for more than ten seconds.

The application to the skin of either liquid air or solid carbon dioxide for a few seconds causes a preliminary freezing of the tissues, followed by a well-marked inflammatory reaction, which, according to its intensity, may result only in thrombosis of the superficial vessels and fibroplastic sclerosis of the epidermal tissues, or any stage between this and complete necrosis.

The action differs from that of the cautery or a caustic in that all the tissue elements frozen are not indiscriminately destroyed, and the resulting scarring is, owing to the gradual transformation of the tissue elements into fine fibrous tissue, much more supple and inconspicuous than when these other methods of treatment are employed. Moreover, the exact amount of inflammatory reaction can be controlled, both as regards extent and depth.

Rodent ulcer is perhaps the skin disease, other than naevi, in which solid carbon dioxide gives the best results. Small rodent ulcers on the face can frequently be cured by a single application of forty seconds with firm pressure, and, if care has been taken to go well outside the raised edge of the ulcer, no further application may be necessary and no recurrence take place. But, if the spreading edge be not destroyed in its entirety and a small portion of the edge be left, this usually gives rise to a recurrence in a few weeks or months. The recurrence is, however, considerably smaller than the original growth, and one or two more applications will complete the cure.

When the original ulcer is of the size of half a crown, or larger, I usually give an initial application of forty seconds, followed by a second application of thirty seconds at the end of the week. The ulcer is then allowed to heal up under boracic acid dressings, which takes about three weeks, and it is then carefully examined to see whether any traces of the edge still require further treatment. If it appears quite cured, I order the patient to present himself at monthly intervals, in order that any possible recurrences may be treated before they have had time to make any headway. The results thus obtained are, in my opinion, equal, if not superior, to any results got with x rays, ionization, and radium, and, of course, with greater rapidity and less expense.

Lupus erythematosus of the discoid, or nodular, variety reacts very well indeed to the treatment with solid carbon dioxide, and fifteen-seconds applications are usually sufficient. When the patches are old-standing ones and there is a great deal of thickening somewhat longer exposures are necessary. The small superficial ulcer which results from the freezing heals up in a week or two, and the newly-formed tissue is usually sound and supple, with very little appreciable scarring. In the much rarer telangiectatic type of lupus erythematosus the diffuse reddening is quite unsuitable for solid carbon dioxide, and it is in these cases that I have found a mixture of carbon snow and ether, repeatedly painted on with a camel's hair brush, is useful to diminish the vascularity. It is similarly useful in cases of acne rosacea, after all the larger dilated vessels have been destroyed by electrolysis.

I have used this reagent in a number of cases of lupus vulgaris, and, although many of the cases can be cured by it, the scarring is rather excessive if no recurrence is to take place. In small patches the isolated nodules can be more satisfactorily destroyed, one by one, by other means, and large patches are better treated by scraping thoroughly and immediately x-raying. If, in addition, a successful Thiersch grafting be performed, the scar will be much better than that got with carbon snow in a really severe case. The latter is, however, preferable to x-raying without scraping, on account of telangiectases which repeated x-raying is so likely to produce.

Localized patches of chronic psoriasis, chronic eczema, and lichen planus respond extremely well to freezing. The irritation caused by the lesions of the two latter diseases ceases immediately after the snow has been applied, the patches heal up with healthy skin after a single application as a rule, and even the soreness caused for a time by the snow is far preferable to the itching previously experienced. Corns and warts lend themselves very well to cure by freezing, but they are such bad conductors that very firm pressure has to be made and the exposure increased to a minute or more. The period of freezing can, however, be appreciably diminished by first shaving down the wart until it is nearly flush with the skin and then applying the stick of solid carbon snow. Corns on the sole of the foot after adequate freezing are apt to be rather excessively tender, owing to the resistance of the underlying plantar fascia and the pressure which it causes on the inflammatory swelling produced by the freezing, but this can be diminished or prevented by injecting a few drops of novocain solution. For corns in this position and for no other skin lesion have I found it advisable to employ any local anaesthetic before freezing. Both corns and warts must have an application of carbon snow sufficiently long to destroy them entirely, otherwise there is danger of recurrence, and, judging from certain recurrences which I have seen, some dermatologists seem to be afraid of giving an adequate dose. A shorter application suffices for seborrhoeic warts.

Chronic ulcers of the leg, when the edge is markedly thickened and indurated, may often be made to take on healthy, healing action by being frozen lightly for about twenty seconds. The object here is not, of course, as in rodent ulcer, to destroy a malignant growth, but to induce the formation of healthy granulations in place of the indolent ulcer base which shows little or no tendency to form fresh, actively growing tissue. The actual edge of the ulcer, if much indurated, should have a longer exposure to carbon snow.

I have recently reviewed a book which recommends solid carbon dioxide for such widely different diseases as alopecia areata, leprosy, and morphoea, but, however excellent a method of treatment in certain well defined diseases of the skin, freezing is not a universal panacea for every form of disease met with in England, whatever it may be in America. Nor has carbon snow as yet displaced all the other physical methods of treatment, such as x-rays, ionization, and Finsen light. But for certain diseases of the skin it provides us with a cheap, rapid, and efficacious method of treatment which gives us the most excellent results and causes the patient a minimum of pain.

DISCUSSION.

Dr. F. GARDINER (Edinburgh) said he unfortunately had not obtained success in spider naevi, and, like Dr. Bunch, had obtained little success in port-wine staining. Lichen planus chronicus benefited in respect of relief from itching, but otherwise there was little change. For warts he preferred x rays and excision—the first method for multiple warts, excision for the isolated variety. The objection to the use of CO_2, especially on the hands, was the subsequent blister, which lasted a week. He would be interested in trying the remedy in other conditions suggested by Dr. Bunch.

Professor R. B. WILD (Manchester) agreed with Dr. Bunch as to the value of carbonic acid snow in the treatment of many forms of skin diseases, but more experience showed clearly that its usefulness was sharply limited, and that its application should not be a routine procedure but adapted to each case both as to duration and degree of pressure. He had found the best results in lupus erythematosus from short applications of five seconds' duration; in lupus vulgaris longer applications were needed, and good results were especially obtained in isolated nodules in scar tissue. In rodent ulcer applications up to one minute gave good results, and one case of epithelioma of the pinna which refused operation had been successfully treated by two minutes' application; the upper third of the pinna with the growth was entirely removed eighteen months ago, and no recurrence had taken place. In naevi the deeper-seated forms were more successful than the port-wine stain and stellate naevi.

CIRCULATORY DISORDERS IN RELATION TO ALOPECIA AREATA AND OTHER FORMS OF BALDNESS.

By DAVID WALSH, M.D.Edin.,
Senior Physician, Western Skin Hospital.

MUCH has yet to be learnt as to the ultimate causes of baldness, whether acute or chronic, partial or complete, premature or senile, diffuse or patchy. This lack of knowledge is possibly due to the fact that loss of hair is symptomatic of an underlying morbid condition, the significance of which in diagnosis has not hitherto been grasped. The obscurity that surrounds the subject is shown by the wide divergence of opinion amongst dermatologists as to the etiology, the pathology, and consequently the classification and the rational treatment of the various forms of baldness. The present object is to draw attention to what the author regards as the vital part played by cardio-vascular defects as a predisposing cause, not only in patchy but also in the diffuse forms of acquired baldness.

Crocker's classification of alopecia areata included: (1) Universal forms, (2) local or neuritic forms, (3) parasitic forms, (4) chronic seborrhoeic forms. Its main cause he believed to be parasitic. His group "alopecia neuritica seu localis" included cases in which definite nerve areas were involved or those associated with leucoderma, or following severe and persistent neuralgia. This neuritic group of Crocker corresponds with that separated from true alopecia by Max Joseph, who included cases in which blows on the head or mental shock are followed by alopecia in angular, band-like or map-like areas.

Personally, the author finds no difficulty in adopting Crocker's classification. There are peculiarities about the generalized alopecias that justify his inclusion of them in a separate group. It seems impossible, again, to avoid his

conclusion that some forms of alopecia areata are infectious. Many such instances have been recorded by competent observers in schools, barracks, and other places where individuals are congregated together in large numbers. The fact that no specific pathogenic organism has been established need not seriously disturb our belief in this group. On the other hand, it can hardly be doubted that many alopecias are for all practical purposes neuritic and non-infectious. As to the seborrhoeic group, it seems clear that scalps affected with that condition are specially prone to baldness, both patchy and diffuse.

Crocker himself fully recognized that there is no constancy in the organisms found in the seborrhoeic forms of alopecia areata. Sabouraud's claim that the flask bacillus is invariably present has not been confirmed. Nor have the particular micro-organisms described by Thin, Schlen, Robinson, and others, found any more general acceptance.

At the outset of an inquiry into baldness one is struck by the fact that it is almost always an acquired condition. Age in itself is not essential to its causation, for a man may live to a hundred years and more and during all that time preserve a luxuriant crop of hair. Its incidence, moreover, has not so far been reduced to any formal terms of cause and effect. Many persons, for instance, suffer from severe neuralgia or sustain severe blows on the head, but relatively few of them develop alopecia areata. Seborrhoea of the scalp, again, is more or less universal in its distribution, but patchy baldness is comparatively rare. The only explanation that appears to the author to cover the whole ground is the assumption of some predisposing condition common to alopecia areata and to the wider class of cases of diffuse or general baldness. That common predisposing cause he concludes to be some cardio-vascular defect. The evidence upon which that opinion is based, from the nature of the investigation, is mainly clinical, and consists for the most part in a collection of cases in which alopecia areata or diffuse baldness has been found associated either with heart troubles (valvular, muscular, or functional), with arterio-sclerosis, or with certain general maladies, such as exophthalmic goitre or Raynaud's disease, in which the circulation is subject to disturbance.

It may be asked what relation a circulatory defect has to a scalp affected with some obvious traumatic agency—say that of seborrhoea. The answer is, that from the examination of a large number of cases the author is convinced that where alopecia areata occurs along with severe seborrhoea it is commonly associated with some obvious circulatory defect, most often central and of valvular origin. It has not been possible to obtain detailed statistics on the point, but as regards chronic and recurrent cases of alopecia areata the author estimates, roughly, that in perhaps eight or nine cases out of ten it is possible to find some marked cardio-vascular defect. In the remaining margin of cases one often finds less definite signs of circulatory inadequacy, such as cold extremities, dusky hands, tendency to chilblains, and feeble pulse. Here and there, as a rare exception, no clear evidence of circulatory disorder could be detected.

The author's general proposition is that in most cases of alopecia areata there can be found a predisposing element in some circulatory disorder. The determining cause is probably multiple, and may be ascribed to traumatism of some kind or other, varying so widely as to include blows on the head, neuritis, mental shock and seborrhoea. The ordinary individual with a normal circulation, central and peripheral, is able to resist more or less effectually the traumatism of seborrhoea, probably because his local means of defence by the blood stream are adequate. Let the blood supply to his scalp, however, become deficient, either from direct or indirect vasomotor influences, from arterio-sclerosis or from disease of the heart, and straightway his local circulatory defences break down and the ordinary normal reaction of the scalp against traumatism is replaced by a morbid passive process. The diminished or arrested blood stream is then no longer able to establish a rapid healthy reaction, to repair local damage, to dilute and neutralize toxins and to antagonize and destroy invading organisms by phagocytosis. In a word, local resistance is lessened or altogether lost.

Robinson of New York has reported a microscopic investigation of seven biopsies of alopecia areata. His conclusions are well summed up by Unna[1], as follows:

> Robinson always found appearances of inflammation, as well as a perivascular, but not very widespread, and not specially perifollicular infiltration with round cells. In most cases the lymph had coagulated in the dilated lymphatics, and some of the larger and smaller arteries contained thrombi. In older cases the blood vessel walls were always thickened. In all the lymph spaces of the cutis Robinson found cocci, numerous in recent cases, and these he regarded as the cause of the affection. The cocci were about the size of the *Staphylococcus aureus*.

Unna agrees with Robinson's views generally, but he did not find cocci in the lymph spaces.

In sections* from a biopsy of a recent alopecia areata by the author cocci can be seen in the dilated lymph spaces around the hair follicles and elsewhere. This agrees with Robinson's observation. In another patient suffering from an extremely chronic superficial spreading dermatitis associated with valvular disease a biopsy was made. The sections again showed what appeared to be cocci in the lymph spaces. In this case cultures of *Staphylococcus albus* were obtained from the lesions. A vaccine has been prepared and treatment commenced, with improvement after three injections. This case appears to be somewhat analogous to the alopecia areata section in its association of apparent cocci in the lymph spaces, in the perivascular changes, and the associated vascular lesion. The shedding of the hair under similar conditions may be regarded as due to an anatomical accident. Lymph stasis is probably a pathological factor of vital importance.

It is recognized that the human skin, and probably hair follicles and glands to a less extent, is the normal habitat of various micro-organisms. The majority of individuals, however, are comparatively seldom affected with resulting eruptions. The author suggests that the essential predisposing condition for the effectual invasion of the deeper cutaneous structures by pathogenic organisms is a disturbed balance of surface circulation due to cardio-vascular disease. The indispensable contributory condition appears to be connected with the diminution or the actual breakdown of the defensive forces presented by a normal circulation against invading bacteria. The latter are enabled to gain a footing in the deeper tissues, where they set up, in turn, defences for themselves against opsonic, phagocytic, and other adverse influences by causing coagulation of blood and lymph. In the case of a hairy region the small capillaries to the hair bulbs probably are blocked at an early stage, and general obliteration of the surface capillaries takes place, the latter being replaced by fibrous tissue. Capillary fibrosis thus induced is accompanied by shrinkage and increased vulnerability of the whole skin.

A similar explanation applies to ordinary baldness. A surprising proportion of cases of baldness in young persons is accompanied by serious cardio-vascular defect. I have noted this association in a large number of cases, of which the following may be taken as a type:

> W. H. B., male, aged 24 years, came to hospital complaining of loss of hair for the past eighteen months. There was a family history of phthisis, but he had always enjoyed good health, and had recently passed a medical examination for life assurance. Beyond a little occasional indigestion he always felt well. The scalp was thin and moderately scurfy; the hair thin all over scalp, especially at crown and vertex. The heart apex was felt in the fifth and sixth interspaces; cardiac dullness reached to the left nipple line; there was epigastric pulsation. A systolic mitral murmur was heard, conducted into axilla; and the arteries were thick for age.

This illustrates the case of a young adult apparently in good health, but in reality suffering from valvular disease of the heart, to the state of which attention was drawn simply and solely by the symptomatic shedding of hair. In the case of premature baldness, as in alopecia areata, and in cutaneous eruptions under similar conditions, the external sign, in the author's opinion, is closely related to the cardio-vascular defect, and in many cases affords earlier and more constant evidence of heart disease than the classical signs and symptoms set forth in the text-books.

Unna and Robinson, the authorities above quoted, agree as to the inflammatory nature of the process in alopecia

* The sections (shown) were made by Dr. Dudley Benjafield, pathologist to the Western Skin Hospital.

areata. Robinson regards the vascular changes as primary and thinks the ultimate cause is infection by micro-organisms. The author agrees with that view, but differs in regarding the essential predisposing condition as some cardio-vascular defect whereby the balance of the surface circulation has been so modified as to destroy or lessen the natural defences of the blood stream and admit the invasion of micro-organisms from the follicles and glands of the skin. When the bacteria have once secured a footing in the corium inflammatory changes follow, with dilatation of blood vessels, small-celled infiltration and oedema. An essential part of the process appears to be plugging of the small arteries, whereby the nutrition of the hair bulbs is suddenly cut off. Apart from that explanation it is difficult to imagine why the hair bulbs in a given area should suddenly become atrophied. To repeat, the view of the author is that there is some predisposing defect of the circulation which diminishes or destroys the natural circulatory defences, and thus permits the invasion of external organisms, and leads to the vascular stasis which ultimately cuts off the nutrition of the hair. The first brunt of this vascular impairment falls on the hair papillae, and is testified by the atrophy of the bulb, which permits the hair to be readily pulled out, showing a pointed instead of a rounded bulb-end.

The general relationship of cardio-vascular defects to many skin affections, especially those of a chronic or recurrent nature, has been dealt with by the author elsewhere.[2] Briefly, it was pointed out that a great number of maladies of the kind were associated with cardio-vascular disease. The skin affection was regarded not infrequently as an early and delicate indication of disease of the heart or the blood vessels, to which attention had as a rule not been drawn in any other way. The pathological process was attributed to the substitution of an abnormal or unhealthy reaction to traumatism of various kinds in place of the power of rapid recovery that characterizes the normal skin. A normal skin recovers quickly, for instance, when exposed to a hot sun, whereas the sufferer from cardio-vascular trouble probably develops more or less prolonged dermatitis. This general view applies, *mutatis mutandis*, to the scalp, where, owing to anatomical conditions the damage shows markedly in the destruction of the hair.

The following case illustrates the general type:

W. S. C., a clergyman, 40 years of age, presented himself with a patch of alopecia areata on the left occiput, of four or five months' duration. The affection began some nine years before on the left chin, a year after he had gone through an earthquake in Costa Rica, and a month after an operation for stone in the kidney. There was no dyspnoea nor dyspepsia, and the urine was normal. Recently he had suffered from a little palpitation, dating from an attack of influenza. His family history was good, and he had enjoyed good health, except that he had suffered from several attacks of malaria. The pulse was 80, regular, compressible; arteries thick. The heart dullness reached to the nipple line, impulse weak; there was a mitral systolic murmur conducted to the axilla.

In this case nothing had drawn special attention to the heart, the valvular affection of which—or its failing compensation, according to the author's view—was probably registered by the appearance of the alopecia patch on the chin.

Another case taken at random from the hospital case-book is that of a girl of 18 who came first in January, 1911, with half a dozen small areata patches. There was seborrhoea of the scalp, and this was looked upon as sufficient cause. She complained at the time of giddiness and shortness of breath, but she looked the picture of health, and at that time the common association of heart disease with alopecia areata had not been suspected. The areata recurred several times, and on December, 1912, she returned with fresh patches, and was found to have a mitral systolic murmur with dyspnoea on exertion and some dyspepsia. She had suffered at times from muscular rheumatism; the pulse was 100, variable and compressible. The case was regarded as one of recurrent alopecia areata in a patient suffering from previously unsuspected valvular disease of the heart. In the author's opinion, the disturbed balance of the surface circulation probably accounted for the failure of the ordinary stimulant remedies to cure the areata in a young subject.

In ordinary diffuse shedding of hair and baldness the essential predisposing condition appears in a surprisingly large number of instances to be some disease of the heart or the blood vessels.

The heart trouble in such cases may be temporary. It may be functional, such as the disturbance due to excessive cigarette smoking. It may arise from dilatation or from failure of compensation, which may be signalled by a diffuse fall of hair, and is not infrequently seen after an attack of influenza. Obviously, the predisposing factor of a weakened circulation would be commonly present in post-influential states. In the post-febrile stages of the exanthems, when hair commonly falls, the myocardium is in most cases affected, and there may be, of course, temporary or permanent valvular mischief. Premature baldness commonly dates from a febrile attack in early life. In such cases the baldness may register a weakening of the myocardium from which the heart has long since recovered, or it may be the outward sign of an incurable valvular lesion.

For the purposes of this investigation 36 consecutive cases of alopecia areata have been noted. Of these 23 were in males and 13 in females; 14 were under 20 years of age and 6 were 50 or over. Of the 36 patients no less than 24 had valvular murmurs and other evidence of cardiac disease, while three others showed general arterio-sclerosis (one advanced atheroma). Of the remaining 7, one had exophthalmic goitre; one chorea and irregular heart action; one irregular action from tea and another from tobacco poisoning; one a feeble circulation;

Thirty-six Cases of Alopecia Areata.

No.	Name.	Sex.	Age.	Occupation.	Duration.	Cardio-vascular Condition.
1	W. S. C.	M.	40	Clergyman	9 years recurrent	Mitral regurgitation.
2	W. F. W.	F.	26	None	1 week	Exophthalmic goitre.
3	J. A. W.	M.	25	Government official	6 to 7 years	Aortic direct.
4	R. H.	F.	27	Home	1 year	Feeble circulation.
5	A. K.	M.	29	Coach-builder	10 years	Aortic and mitral systolic.
6	F. W.	M.	39	Traveller	3 years	Arterio-sclerosis.
7	A. N.	F.	27	Home	Recent	Mitral regurgitation.
8	M. G.	M.	45	None	"Years."	Double aortic.
9	K. F.	M.	16	Home	9 years	Mitral regurgitation.
10	S. S.	M.	15	Tea-taster	8 years recurrent	Irregular action (tea).
11	W. T.	M.	21	Farrier	8 years recurrent	Aortic direct.
12	F. R.	M.	9	School	4 years recurrent	Chorea and irregular action.
13	G. W.	F.	18	Home	2 years recurrent	Mitral regurgitation.
14	G. R.	M.	17	Printer	1 month	Mitral regurgitation.
15	C. A.	F.	70	Home	"Years"	Multiple murmurs.
16	J. W. C.	M.	22	Engineer	2½ months	Tobacco heart.
17	T. A.	M.	32	Clerk	4 months	Aortic and mitral systolic.
18	A. B.	M.	26	Porter	10 years recurrent	Mitral regurgitation.
19	C. D.	M.	42	Labourer	5 years	Atheroma.
20	G. B.	M.	50	Painter	4 months	Aortic direct.
21	L. H.	M.	32	Carter	—	Arterio-sclerosis.
22	C. C.	M.	24	Porter	2 years	Negative.
23	T. C.	M.	45	Bootmaker	3 years	Aortic double.
24	H. H.	M.	25	None	—	Mitral regurgitation.
25	G. C.	M.	—	Clerk	10 years	Mitral regurgitation.
26	T. P.	F.	28	Teacher	"years"	Mitral regurgitation.
27	L. K.	F.	25	Post Office	1 year	Mitral regurgitation.
28	W. P.	M.	26	None	3 years	Mitral regurgitation.
29	W. H. B.	M.	24	Clerk	8 years	Mitral regurgitation.
30	W. J. F.	F.	32	Teacher	3 years	Mitral regurgitation.
31	L. B.	F.	22	Factory	12 years	Arterio-sclerosis.
32	A. W.	M.	19	Clerk	2 years	Mitral regurgitation.
33	B. F. F.	F.	25	Home	8 years	Mitral regurgitation.
34	L. W.	F.	26	Home	8 years	Negative.
35	N. T.	F.	37	Teacher	1 year	Mitral regurgitation.
36	B. A.	F.	18	Machinist	9 months	Negative.

while in three only could no marked abnormal circulatory condition be detected.

Of the 24 valvular conditions, 18 showed mitral regurgitation, and 2 of them aortic mischief as well; 5 were direct aortic, 2 of them direct and regurgitant; and 1 showed multiple murmurs in a terminal stage of cardiac disease.

It may be objected that in cases of alopecia following mental shock the cause is evidently neurotrophic, and that cardio-vascular disturbance does not enter into the question. The answer is that shock does not produce alopecia areata in all individuals but only in those who have a certain predisposition, which may be either cardio-vascular, or due to a temperament in which the heart is peculiarly liable to be disturbed. Some years ago the author described a type of individuals, characterized by a congenital high forehead and abnormal thyroid gland, in whom shock was apt to be followed by a curious symptom-complex in which were to be found tremors, nervousness, depression, tachycardia, palpitation, headaches, exophthalmos, diffuse and patchy baldness, and so on. There was a special tendency to exophthalmic goitre and myxoedema, the two being sometimes associated. This temperament, with its consequences, was often met with amongst poorly-fed children in an out-patient department. So far as myxoedema is concerned, the author cannot recall a single case in which the patient had not a congenital high forehead. Where shock is followed by alopecia areata the same condition, in the author's experience, is almost always present. The associated instability of the heart condition in such cases is shown by the quick and variable pulse, the palpitation, and sometimes by the physical signs of a dilated heart.

As regards the diagnosis of the cardio-vascular defect, no cases have been recorded which appeared to be doubtful. In all instances independent medical confirmation has been obtained. It happened on various occasions that examination of the heart proved negative when the patient was standing up and was auscultated with an ordinary binaural stethoscope. Patients were therefore invariably examined with a stethonoscope lying down after previous exertion, under which circumstances an otherwise latent valvular murmur was sometimes detected.

The practical application of the cardio-vascular relationship of skin affections, assuming it to be established, is obvious. In future the dermatologist called upon to treat any form of alopecia will investigate the cardio-vascular system as a matter of routine. If any defect be discovered, his guiding principle will be to restore as far as possible the normal balance of the surface circulation. The heart condition may demand rest, purging, cardiac tonics, iron, appropriate diet, and so on, while locally for the scalp massage, antiseptic stimulant applications, mild galvanization, and other measures to restore surface circulation are indicated. As regards diagnosis, the occurrence of patchy or of ordinary baldness should at once suggest an examination of the central and peripheral circulatory system. As to prognosis, the existence or otherwise of an associated cardio-vascular defect can hardly fail to be pertinent. At any rate, the author may claim that in the long series of cases in which cardio-vascular disease has been found associated with various forms of alopecia, the discovery of that circulatory defect has enabled him to substitute a rational for a purely empirical line of treatment, for some of the patients in whom unsuspected serious disease of the heart was detected were in the habit of taking violent exercise at football, cricket, tennis, and cycling, and of indulging in such habits as excessive smoking and tea-drinking.

The author's main conclusions are as follows:

1. That the abnormal loss of hair, whether acute or chronic, diffuse or patchy, is in the majority of cases associated with some serious cardio-vascular defect, which constitutes an essential predisposing cause.

2. That given this predisposing cause the exciting cause may be one of various bacterial, chemical, or other physical or mental agencies, acting either directly or indirectly.

3. That alopecia areata is simply a localized form of diffuse baldness, and both are probably due in most cases to exciting traumatism and predisposing cardio-vascular defect.

4. That a similar explanation applies to a surprisingly large proportion of skin eruptions, some of them acute, but more often chronic or recurrent.

5. That the predisposing cardio-vascular condition may be (*a*) cardiac valvular, myocardial, or functional; (*b*) vascular, as arterio-sclerosis; (*c*) neuro-vascular, as exophthalmic goitre or Raynaud's disease.

6. That in some cases the skin sign, in the form of alopecia or eruption, may register a failure of compensation. For instance, when an attack of influenza breaks down the compensation of a pre-existing valvular lesion an acute shedding of hair follows.

7. That in all forms of baldness it is desirable to make a careful examination of the heart and circulation generally.

8. That baldness, whether diffuse or patchy, premature or senile, often forms an early and delicate sign of disease of the heart or the blood vessels, to which attention in many instances has not previously been drawn by the classical signs and symptoms described in the textbooks.

9. That the examination of the heart should be made with the patient lying on the back immediately after exertion, and that a good modern instrument, such as the stethonoscope, should be used.

10. That a similar explanation, *mutatis mutandis*, applies to the numerous skin eruptions associated with cardio-vascular disease.

11. That from a pathological point of view the predisposing part played in these cardio-vascular cases depends on a disturbed balance of the surface circulation and acts in a two-fold manner: (1) By diminishing the natural local defences of the skin circulation against the invasion of bacteria from without; (2) by predisposing to the formation of clots, with subsequent damage to nutrition and shrinkage of capillaries (fibrosis); (3) by inducing lymph stasis.

12. That the result of traumatism in an individual with predisposing cardio-vascular defect may be described briefly as the substitution of an abnormal reaction to traumatism in place of the usual speedy recovery that takes place in a healthy person—for instance, where exposure to a hot sun produces a more or less violent dermatitis, usually, according to the author's experience, a defective circulation is present.

13. The term "idiosyncrasy," applied to baldness and various skin complaints, in many cases simply indicates a predisposing cardio-vascular defect, and in much the same way the so-called "hereditary tendency" to baldness or certain skin complaints in all probability means an inherited tendency to cardio-vascular complaints.

14. That so far as patchy baldness is concerned a series of 36 consecutive cases has been investigated; in 24 of these there existed valvular disease of the heart, in each instance confirmed by independent medical examination; three others showed arterio-sclerosis, while in three cases only was no marked circulatory trouble noted.

15. That prognosis and treatment in all forms of baldness, as well as in many skin diseases, must to a great extent depend on the state of the cardio-vascular system.

REFERENCES.

[1] *Histopathology of Diseases of Skin.* English translation, 1894, p. 1093. [2] BRITISH MEDICAL JOURNAL, August 10th, 1912; *Medical Press and Circular*, May 14th, 1913.

DISCUSSION.

Dr. ALFRED EDDOWES (London) said that of course circulatory disturbances had an effect on the skin. Every one knew about so-called varicose ulcers; for example, about ten years ago the speaker had hundreds of hairs from alopecia areata cases examined, and the micro-bacillus was found so constantly and in such numbers as to lead him to conclude they were always present, and when not found it was the fault of the person who did the staining. Many cases were probably due to infection at the barber's shop. Still the fact that some cases immediately followed exhaustion and shock gave some support to Dr. Walsh's conclusion as to the importance of circulatory failure.

Dr. GRIFFITH (London) said that in his experience he had not noticed any special relationship between alopecia

areata and gross cardio-vascular lesion, and he submitted that Dr. Walsh had not established the fact that any such relationship existed.

Dr. Sequeira (London) inquired whether the 36 consecutive cases of alopecia areata in which Dr. Walsh had found cardio-vascular distension in 30, were not at a hospital for heart diseases.

Dr. Barendt (Liverpool) thought that the practical point in Dr. Walsh's paper was the importance of thoroughly examining the patient, and not regarding the skin affection from too narrow a standpoint.

Mr. Bernhard Smith (London) thought that heredity, as a cause, had not been given the importance that it deserved. The habit of clipping the hair, and the wearing of hats which, by compressing the temporal arteries, restricted the blood supply to the scalp, were no doubt in some cases contributory factors; but, after all, patients cared little as to the cause of their baldness, and doctors were beset with applications for a cure. Their treatment had become, in the eyes of the laity, a reproof to the profession. Doctors were forced to fall back on the hereditary theory when pressed as to a cause of the condition; and indeed it would seem that, like the impulse towards suicide, baldness among the men of certain families commenced with considerable regularity at a certain time of life. They were inevitably led back to the personal equation, and the dread of baldness felt by so many people at 40 or therabouts, more especially on aesthetic grounds, but laughed at when the danger was passed, was a very real one.

AN UNUSUAL CASE OF ACNE NECROTICA.

By F. Gardiner, M.D., F.R.C.S.,
Lecturer on Diseases of the Skin, Edinburgh University.

This condition is a comparatively rare one, and as the following case is characterized by unusual distribution I have thought fit to record it.

J. C., aged 21, a fisherman in the North of Scotland, was admitted in January of this year. A cousin on the male side is somewhat similarly affected, but otherwise his family history is good, and up till seven years ago he never had anything of serious moment wrong with him. The eruption first appeared at the back of the neck in the form of furuncles which discharged, crusted, and then cicatrized. For about a year the distribution was limited to that region and the face, but after that it gradually spread to the trunk and limbs. He then was admitted to Aberdeen Infirmary, and Dr. Christie reported that the lesions all disappeared under exposure to *x* rays. Unfortunately he had only resumed his occupation as a fisherman for a few months when the condition recurred, and in spite of treatment by his own doctor at home it has gone on gradually spreading.

On admission he seemed rather dull-witted and lethargic, but the ward sister remarked that among the patients he was noteworthy for a keen sense of humour.

No evidence of affection of the nervous system was obtained, except sluggishness of the pupils and a difficulty in articulation which had existed from childhood.

The alimentary system was normal.

The urine showed slight albuminuria and occasional haematuria, but no casts. Bacteriologically it was negative. Dr. Boyd, who kindly examined him for me, would not give any explanation.

The circulatory system was free of any organic mischief. Pulse regular. Blood pressure 140. Red blood corpuscles 4,400,000, white corpuscles 13,000, and of these polymorphs represented 58 per cent., large mononuclears 36 per cent., eosinophiles 5 per cent., and myelocytes 1 per cent.

Skin Condition.—Practically the whole surface except the hands and feet were involved.

The scalp showed some pustulation—not marked, however.

The forehead, cheeks, and chin showed the pocked scars of old acne with very few comedones, and only one or two isolated papules on the chin. Near the angles of the jaws were some oval depressed scars, pinkish in colour, about 1 in. by ¼ in.

The neck showed numerous large confluent comedones with tags of skin over them in places; at other areas there were pitted scars and isolated comedones. The regions most involved were the nape of the neck and the areas inferior to the ears. Several furuncles were observed just below the fringe of the hair at the occiput.

Both anterior and posterior aspects of the chest showed numerous areas of scar tissue, in some places pink, in others pearly white, but all markedly atrophic, with the skin edge raised and irregular. These areas were of all conceivable shapes, and even as much as 3 in. at their widest measurement.

Interspersed were furuncles not evidently deep, but multilobulated like a kerion, with more redness around. Isolated and grouped undermining comedones filled up the picture, which then showed only scattered irregular areas of unaffected skin. The front and back of the abdomen showed a similar state, but not so severely scarred.

The furuncle stage seemed more in evidence here as there was more sound skin to become infected. The upper and lower limbs showed more distinctly what one takes for one form of commencing lesion, namely, a small papule slightly hyperkeratotic and generally about the size of a pinhead. On the body the commencement was evidently a comedo. There was some scar tissue on the arms, but much more on the lower limbs, where also the crusted furuncle and pigmentation were a pronounced feature. A curiously stubborn area of pustulation was on the left popliteal space.

A first glance at the limbs suggested a bromide rash, and one has seen it identical in appearance to this. Careful inquiry, however, revealed the fact that no drugs of any kind were responsible.

Syphilis was then eliminated as far as possible by obtaining a negative Wassermann reaction and questioning the patient.

A biopsy revealed nothing special except infiltration of small cells, and no evidence of tuberculosis. To make certain a guinea-pig was inoculated, with again negative results.

Films of the pus stained showed a Gram-positive, short bacillus, and cultures were then made on various media, but only in old broth cultures did one obtain the bacillus, otherwise the staphylococci seemed to kill it off. Evidently acne bacillus.

Treatment.

Boric starch poultices were applied to the pustular area and elsewhere; sulpho- and then boro-calamine lotion was applied. These lotions were found to be irritating, and zinc paste and vaseline containing 5 grains to the ounce of ammoniated mercury proved more suitable to the skin.

X rays were used for three or four weeks in doses of five to ten minutes four times weekly without benefit. Then pastille doses at intervals of three weeks to one or two areas also proving ineffective, this method of treatment was stopped.

Thereafter a vaccine made from the bacillus has been given with some interruption about once a week in doses commencing at 40 millions, increasing. There has been some improvement, and one noticed that when the vaccine ran out he seemed to get worse and more depressed than before. Now he is also on zinc, potash and ichthyol lotion, and has been taking ½ to ¾ grain thyroid for some weeks. In brief, the chief point in this case is the unusual and wide distribution.

I beg to express my indebtedness to Dr. James Ritchie, of the Royal College of Physicians Laboratory, for bacteriological examinations, and to Dr. Maclaren, the house-physician, for valuable notes and assistance.

DISCUSSION.

Dr. R. A. Bolam (Newcastle-on-Tyne) said the President would remember a somewhat similar case where the affection, contrary to general experience, affected not only the trunk but also the limbs, which was shown by Sir Malcolm Morris at the Dermatological Section of the Royal Society of Medicine. It had been benefited by use of an autogenous vaccine, but recently the speaker had seen the case once again, and the condition was unfortunately now much the same as formerly. These extensive infections were extremely difficult to treat.

Dr. F. H. BARENDT said that acne necrotica was originally described as acne varioliformis, and being confined to the forehead had been termed acne frontalis. He regarded Dr. Gardiner's case as a diffuse acne indurata.

SOME REMARKS ON OINTMENTS.

By HALDIN DAVIS, M.B., B.A.Oxon., F.R.C.S.Eng.

FROM the earliest times fatty and greasy preparations have been used for application to the skin both for therapeutic and cosmetic purposes. References will be found to them with some frequency both in theological and classical literature. At the present time the term "ointment" is limited by general consent to those preparations which are supposed to possess a therapeutic value; those which are of cosmetic importance are variously designated creams, cold creams, massage pastes, skin foods, etc., and those in some ways are more interesting than the purely medical ointments. In former times all sorts of weird and wonderful things were put in ointments or salves, a word which is still popular among out-patients, and they were incorporated in a greasy and fatty mixture of bases derived from every quarter of the animal and vegetable kingdoms. Now, however, we have altered all that; polypharmacy has become a thing of the past, and we now practically use only two bases, lard as an emollient base, paraffin as a protective. With these we incorporate one, two, or scarcely ever more than three drugs, each with a definite and clearly defined function. Lard, of course, has been known from time immemorial, and in many ways is a perfect emollient, but has the grave disadvantage of easily becoming rancid. It is only in comparatively recent times that the chemists have learnt to preserve it by the addition of benzoin, which, however, has the drawback of making it somewhat irritating, so that it is unsuitable for eye ointments and occasionally irritates sensitive skins. It is interesting to note, on the other hand, that paraffin is a product of modern organic chemistry and was only introduced into pharmacy as recently as 1877 as a proprietary article from America under the now familiar name of "vaseline." It is interesting to refer to the old numbers of the *Year Books of Pharmacy*, in which numerous communications on this, at first mysterious, substance may be found. Being a non-irritating substance with few chemical affinities, and therefore stable, with no tendency to decomposition, but capable of incorporation with almost any drug, it forms almost a perfect base for protective ointments. For those ointments which are designed to be rubbed into the skin it is unsuitable, because it is only absorbed with great difficulty. This has been clearly brought out by Dr. Gardiner in his work upon the absorptive powers of various bases. As every doctor knows, paraffin may be liquid, soft, or hard, according as the product under examination is a lower or higher member of that series of hydrocarbons which begins with marsh gas and, theoretically at any rate, stretches out to infinity. In every case the formula is on the plan $C^nH_2N_2$, that of marsh gas being CH_4. The solid paraffins of pharmacy range from $C_{21}H_{42}$ to $C_{30}H_{62}$. The paraffins have been introduced into the *British Pharmacopoeia* formulary as the unguentum paraffini. The formula for this preparation is 70 per cent. soft paraffin and 30 per cent. hard.

This mixture has the disadvantage of lacking uniformity of consistence and also of being too soft in warm climates and too hard in cold. Mr. E. W. Lucas, who has given much study to the question of ointments for the Pharmacopoeia Committee, suggests the following modification for a standard temperature of 15° C.:

Hard paraffin (melting-point 54–57° C.)	...	27 per cent.
Soft paraffin (melting-point 44–46° C.)	...	70 ,,
Beeswax		3 ,,

The introduction of the beeswax enables a mixture of uniform consistence to be prepared and at the same time does not interfere with the valuable properties of the paraffin. Mr. Lucas also suggests that in the next edition of the *Pharmacopoeia* proportions ought to be quoted for the following variations of temperature: 10, 20, 30, and 35° C. This series is adequate to cover the extremes of indoor temperatures met with throughout the British Empire. A further suggestion of Mr. Lucas is that there should be an official unguentum emolliens, of which the provisional formula might be:

Lard		40 per cent.
Wool fat		40 ,,
Paraffin ointment (as above)	...	20 ,,

This mixture, unlike pure lard, keeps well.

The most promising field for original work upon ointments lies in the department of pharmacology. In some cases the action of drugs incorporated in ointments is fairly easy to understand; in others it is very obscure.

Most of the simple instances are antiseptic in principle, and there is little difficulty in realizing the capacity of a mercurial ointment to deal with a superficial septic infection, like impetigo, or a surface-growing fungus, such as tinea circinata or tinea versicolor, although the same remedies are almost powerless against more deeply-seated infections. The soothing drugs which are used in the treatment of irritative and non-microbic inflammations of the skin, of which the best example is eczema, owe, in my opinion, their value to their negative as opposed to their positive qualities. Everyday experience shows that zinc oxide and zinc carbonate are the most useful drugs to incorporate in an ointment for the treatment of eczema, and I believe that the right explanation of their efficacy is the fact that they are chemically quite inert. They owe their therapeutic value to their physical qualities, in that they form a protective covering to the inflamed tissue, preventing contact with its external surroundings, and therefore give the natural recuperative powers of the skin a chance of exerting themselves.

It is usual to speak of the astringent properties of zinc. What is an astringent? An astringent, according to the dictionary, is a substance which contracts the tissues and canals of the body, condensing the soft solids, and thereby checking or diminishing excessive discharges (*Century Dictionary*). There is no evidence that zinc compounds have any vaso-constricting action; the only way in which they conform to the above definition of astringency is that they precipitate proteins from their solutions, forming an albuminate. Probably, when used for discharging surfaces, this phenomenon does occur to some extent, and the albuminate forms an additional protective layer, but when used on a dry surface even this action does not take place. Bismuth is also said to be an astringent; how inert that metal is has been repeatedly demonstrated during recent years, since it became the fashion to feed patients on bismuth for the purposes of visceral investigation. Ounces of bismuth introduced into the stomach have, it seems, absolutely no action upon that organ, the mucous membrane of which is many times more sensitive than is the skin. Upon the skin ointments and pastes of bismuth have precisely the same therapeutic properties as those of zinc; probably the reason that they have never been introduced largely into dermatology is that they are about ten times as expensive.

There are other drugs which are employed empirically with great success in ointments, the action of which is far more difficult to explain. The action of sulphur, one of the oldest dermatological remedies, is still as mysterious as ever. Although undoubtedly an antiseptic, its antiseptic properties are insufficient to explain its action in acne vulgaris and acne rosacea.

Among all the array of organic compounds now lately introduced to us by cunning chemists, including the tar derivates, whether of animal, vegetable, or fossil origin, gallic acid, and its congeners (with the solitary exception of salicylic acid, which we know acts upon horny cells), there is not one whose action is really understood. The key to the solution of these problems lies no doubt in the study of the biochemistry of the cell, a study which is still in its infancy, although some progress has lately been made, especially by Unna and his school. The results of their work will be found in Unna's new book, *Biochemie der Haut*, which, however, deals particularly with the special processes of oxidation and reduction. It is a most fascinating, but difficult, study in chemical histology.

Cosmetic Preparations.

Cosmetic ointments include cold creams and massage pastes, and between these no hard and fast division can be drawn. The same mixture may be used at one time to act as a simple cooling preparation, and at another as

a lubricant for the fingers of the masseuse whose duty it is to rub the patient's face. When used under the latter conditions it is often dignified with the name of skin food. This specious appellation has of course been invented owing to the fact that in the process of attrition the cream disappears, and the patient deludes herself into the thought, encouraged by the beauty specialist, that she is replacing the subcutaneous fat which the hand of time has threatened to remove, whereas in truth, as every physician knows, the valuable part of the treatment is the rubbing, and one face cream is as good as another except, it may be, in elegance. The qualities which are especially desired in a good face cream are smoothness, homogeneity, no stickiness, and complete disappearance when rubbed into the skin. For these reasons no ointment which contains an insoluble metallic salt such as zinc oxide is suitable for these purposes. Among the forty-five ointments of the *British Pharmacopoeia* there is only one which is of purely cosmetic value, and that is not very satisfactory. This is the unguentum aquae rosae. This preparation is supposed to be the lineal descendant of the original cold cream invented by Galen, and its formula is:

Rose water (undiluted)	70 parts
White beeswax	15 ,,
Spermaceti	15 ,,
Almond oil	90 ,,
Oil of rose	0.17 ,,

This formula has two disadvantages: (1) That the percentage of water is too high, which makes the cream difficult to compound, and, when made, is liable to separate out; and (2) the presence of spermaceti, which is useless, and renders it likely to become rancid. Mr. Lucas, in his report to the Committee for the revision of the *British Pharmacopoeia*, suggests instead the following:

White beeswax	18 per cent.
Almond oil	61 ,,
Borax	1 ,,
Rose water	20 ,,
Oil of rose	0.1 ,,

The only disadvantage of this formula is that the borax is incompatible with mercurial salts. But this is unimportant because it is very improbable that the necessity will ever arise for their incorporation with a cold cream.

Another simple formula which yields a satisfactory cream is as follows:

Borax	gr.xx
Parolein	℥ij
White beeswax	℥ij

Those creams which are specially intended to be rubbed into the skin, and which, therefore, particularly deserve the name of skin food, are now made, as a rule, with a basis of either stearic acid or casein. True fats, although they are fairly readily absorbed, are not so popular because they are likely to become rancid in the presence of water. The stearic acid creams when properly made vanish completely when rubbed into the skin, and thus are often known as vanishing creams. They are made by the neutralization of hot stearic acid with a weak solution of sodium carbonate; a little glycerine is then added. Stir from time to time when cool. Firmness may be imparted to the resulting cream by the substitution of quince or Irish moss mucilage for some of the water. Drugs should not be added to these creams. In making casein creams it is best to employ freshly precipitated casein, although the manufactured article may also be used. Casein should be precipitated from separated, not skim, milk, which contains too much fat, with 1 per cent. hydrochloric acid. This should be added in a thin stream to the separated milk, heated to a temperature of 150° F., stirring the while. The precipitate settles slowly, and should be collected upon a muslin strainer. After thorough washing it is carefully compressed and beaten up thoroughly with a little boric acid, glycerine, and the necessary amount of perfume in a mortar. Lard should not be incorporated in massage creams. It is more used on the Continent than in this country.

Dr. Barendt (Liverpool) agreed that unguentum zinci acted purely as a protective, and he would mention in this connexion unguentum plumbi carbonatis—the unguentum cerussae of old authors—which was now somewhat neglected owing to fear of plumbism.

Dr. Semon (London) mentioned a case at present in the wards under Dr. Gray's care at University College Hospital. This patient, during the three months he had been under treatment for ever-recurring relapses of a generalized eczema madidans, had run through most of the recognized lotions and ointments in that time without obtaining marked relief. He was now being treated exclusively with frequent applications of pure liquid paraffin, under which he certainly seemed to be improving. This case, he thought, confirmed Dr. Davis's views on the protective action of paraffin.

Dr. Eddowes (London) thought paraffin agreed in Dr. Semon's case because it did not become rancid. Rancidity was probably accountable for much internal and external irritation. Rich fats were liable to suboxidation. He asked if members had noticed that some people had peculiar secretions of skin, and they smelt rancid after bathing though not before getting wet. Probably the moisture hastened suboxidation of unstable fatty secretion.

Dr. L. J. Hobson (Harrogate) said he had found the liquid form of paraffin called Dee oil a most valuable protective and healer, and in certain cases of eczema a 1 in 60 strength of carbolic acid in this oil was an antipruritic as well. It was also a valuable addition to the bases of ointments, and blended well with lanolin.

Professor R. B. Wild (Manchester) said the difficulty in regard to the paraffin ointments was largely due to the fact that mixtures of hard and soft paraffin were not homogeneous, and examination under the microscope with a power of 250 diameters, and especially with polarized light, showed that the hard paraffin was in a crystalline form; this was apparently due to the wide difference between the melting-points of the hard and soft paraffin.

TREATMENT OF CHRONIC ULCER OF LEG.

By A. Winkelried Williams,
Brighton.

This paper is limited to the treatment of ambulatory cases of chronic ulcer of the leg. These cases, above all others, appeal to our sympathy on account of the brave heroism of the majority of the sufferers. The brief reply, pregnant with noble self-sacrifice, so constantly given to our advice for the patient to lie up or go to the infirmary, is: "Doctor, I cannot; for if I did my home would be broken up, and what would become of my children?" So they continue, the majority being women standing for long hours at the laundry and other occupations, and this must of necessity increase their sufferings and the duration of their disease.

I hope in the discussion of this subject we may assist each other in the treatment of these unsatisfactory and difficult cases.

The literature is exceeding great on the subject, and the following summaries of some of the treatments recommended from time to time may be of service:

Tincture of Aloes.—V. Dehaine.[1] (*a*) Ulcer cleansed; (*b*) surface painted with tincture of aloes and allowed to dry; one coat for superficial, two coats for deep ulcers; (*c*) Unna's zinc gelatin or Lassar's paste over all. Coffin[2] previously had recommended tincture of aloes.

Alum and Lead Lotion.—Marcuse[3] recommended alum 5.0, plumbi subacetate 25.0, aqua destil. 500.0, as a means of checking secretions and improving vascularity. Sometimes painful for ambulatory cases and better for patient to lie up. Followed by Unna's zinc jelly.

Airol.—Veiel[11] recommends as preferable to iodoform.

Benzoin.—H. S. Purdon.[47] Tinct. benzoin. compos. one or two drachms to an ounce of ung. zinci. It is a specific for sluggish ulcers. Tzitrin[41] recommended benzoin 2 drachms, lard ½ oz., wax ½ oz., thickly spread on lint for atonic ulcers.

Balsam of Peru.—Aronheim[45] recommended the following: Argent. nitrat. 0.3, balsam of Peru 5.0, paranephrin 2.0, ung. diachyli ad 50.0. Pettreto[42] recommended argent. nitrat. 1.0, balsam of Peru 20.0, ungt. simpl. 300.0.

Pure Carbolic Acid.—Painting surface of ulcer with pure carbolic as a means of disinfecting it is recommended by many writers, for example, B. C. Stevens,[46] D. Couper.[9]

Calcium Hypochlorite.—W. Zeuner[5] recommended (1) 1 per cent. calcium hypochlorite soaked in gauze to cover ulcer with, in deep ulcers, wool over it; (2) bandage firmly to press gauze down on all parts of ulcer. Renew dressing twice daily.

Internal use of Calcium Iodides.—Arbour Stephens[15] introduced and strongly recommended it in doses of 2 or 3 grains three times daily. A. G. Peters,[56] B. C. Stephens,[46] and others, including J. Donnell,[55] who recommends it in 10-grain doses three times daily, with local use of unguentum. "J. D."[57] found calcium iodide upset patient's stomach and did not cure the ulcer.

Copper Sulphate.—Blanc[40] recommended 1 per cent. compresses.

Abstinence from Chlorides.—P. Oliver,[59] led by the good effects of abstinence from chlorides in other oedemas, tried it in leg ulcers. He gave food containing a minimum of common salt, and with the seasoning addition of only 22 grains daily; this in several cases was followed by the disappearance of leg oedema in from six to ten days and cure of the ulcer in from two weeks to two months. He also records failures.

Decalcified Cancellous Bone and Sponge Treatments.—Kirsch.[8] (1) Deep ulcers filled with iodoform gauze, superficial simply cleansed; (2) sponge with flat under surface moist and swollen with water but not too wet applied and bandaged firmly on. James MacMunn.[62] Sprinkle slice of sponge with iodoform and strap it to ulcer. Rapid stimulation if granulations result. B. C. Stevens recommends decalcified bone as an improvement on sponge. (1) Cleansed ulcer well swabbed with hydrogen peroxide; (2) cut bone into thin slices and cover ulcer entirely, or around edges in very large ulcers; (3) boric lint wrung out in hot water, cotton, crêpe bandage.

Fomentations followed by Mercurial Ointments or Powder Applications.—Wilmot Evans.[12] (1) Internal treatment by large doses of iodides until ulcer heals, later on mercury; (2) begin local treatment of sloughy, fetid ulcers by fomentations, for example, boroglyceride 1 drachm, hot water 10 oz.; (3) cleanse ulcer with lotio hydrarg. flav.; (4) mercurial ointments, the best being hydrarg. ammon. chlor. or hydrarg. oxid. flav., or else cover the ulcer with a powder in large quantity, for example, calomel ½ drachm, zinc oxide 3 drachms, Kieselguhr to 1 oz., and allow ulcer to heal up under powder crust.

Other Powder Treatments.—Marchetti.[16] (1) Cleanse ulcer successively with hot water, alcohol and ether, perchloride of mercury. (2) Cover the ulcer with boric powder, then four layers G.P. tissue, then sterilized gauze. Cotton and bandages. Keep on for at least five days. Thies.[17] Fine sand, sterilized by prolonged boiling in 10 per cent. soda solution, is applied in a thick layer and changed when foul or every third day. (N.B.—Is rather a painful treatment in chronic ulcers of leg.) Diossjilagyi.[18] (1) Ulcer covered with thin gauze bandage; (2) thick layer gypsum over gauze-covered ulcer; (3) cotton-wool and G.P. tissue. The gypsum, wool, etc., is frequently changed without removing gauze bandage. Later on an ointment of argent. nitrat. 0.30, balsam of Peru 3.0, zinc. oxid. 2.0, vaselin. flav. 30.0. Saalfield[60] recommended in varicose ulcers with eczema dusting with europhen, with or without boric acid.

Drugs Stimulating Epithelial Formation.—Allantoin, derived from the common comfrey, is recommended by Macalister[27] in 0.3 to 0.4 per cent. watery solution; it is also recommended by Macalister[27] in Donnell.[55] C. Searle[54] records the cure of a severe extensive fungating ulcer of the foot by fomentations of comfrey root. *Scarlet Red Dye.*—Cernezzi[28] recommended Grubler's scarlet red, 8 per cent. in lanoline or vaseline (weaker if it irritates), to be painted on edge of ulcer in very thin layer, and before reapplication to be most carefully cleansed off. Then cover with G.P. tissue, gauze, and wool. Other writers recommend scarlet-red for ulcers—for example, J. S. Davis,[69] Gaudie,[29] Lemaire,[30] McDonagh,[13] K. Pein,[66] Strauss.[31] *Amido-Azotoluol.*—W. Katz.[33] Amido-azotuluol is more reliable and does not stain linen so much as scarlet red; he recommends 8 per cent. ointment spread on gauze and limited to the areas of granulations; it should be frequently changed and alternated with a simple ointment. Gurbski[33] has recorded poisoning similar to aniline from use of amido-azotoluol for burns; on this account a derivative—that is, azodermin, which is less toxic, has been introduced to take its place. Curschmann[34] reports favourably on use of azodermin in leg ulcers. *Pellidol*, another derivative belonging to the same group as azodermin, is strongly recommended by C. Decker[35] and Retzlaff[36]; all the advantages of amido-azotoluol can be obtained from a much weaker ointment of pellidol—that is, 2 per cent. obtains the maximum good effects. *Various Aniline Dyes.*—Sachs[37] has shown from experiments on animals that most aniline dyes have the power of stimulating epithelial proliferation, and that dyes other than aniline have not this property.

Iron and Thymol.—M. J. White.[74] (1) Wash ulcer with carbolic lotion and remove crusts, etc., from borders. (2) Dust ulcer with a powder (that is, thymol iodide and ferri sulph. exsic., equal parts), and when it smarts blow off all the excess of powder. (3) Apply zinc ointment, gauze, and bandage. N.B.—If much of the powder is used, acute pain and severe inflammation results.

Local Massage.—Cyriax[23] strongly recommended Kellgren's method—that is, (1) empty veins below ulcer as far as possible by elevation of limb and massage. (2) Fingers placed on skin round ulcer and vibratory movements, ten to twelve per second, with considerable pressure; gradually get nearer to ulcer and continue until edges of ulcer become wet with exuded lymph. (3) Then, if patient can bear it, put lint on ulcer and similar vibratory movements on ulcer surface. (4) Then hands on skin each side of ulcer and pressure movements to relax and stretch borders. (Take ten or fifteen minutes daily.) Erdinger[53] also strongly recommended massage.

Mercurial Injections.—Meshcherski[43] records case of varicose ulcers with elephantiasis which had resisted all treatments for years cured by four intramuscular injections of calomel.

Naphthalin (Treatment for smaller ulcers).—H. J. Takowlew.[4] (1) Cleanse ulcer and parts around. (2) Cotton wool size of ulcer dipped in antiseptic solution and then powdered naphthalin spread upon it and placed over ulcer. No water to touch surface. (3) G.P. tissue and bandage. Keep on eight to ten days and renew, later to be kept on much longer.

Open Air Treatment.—Exposure of ulcers to open air is recommended by E. H. Sweet[38] and W. Ewart.[80] To open air and bright sunlight by F. Laurent.[42] Treatment by oxygen gas by G. Stoker.[75]

Pyroléol is recommended by H. Lenloir.[63]

Quinine Locally.—Alfodi[21] recommended a 1 per cent. solution.

Radium and X Rays.—T. R. Macdonald[58] records rapid conversion of a long-standing ulcer into a healing ulcer by half-hour application to every part of the ulcer of 200 mg. pure radium bromide through very thin rubber tissue and no other filter. W. Evans[12] finds that gummatous ulcers of leg resisting other treatments are much benefited by a half Sabouraud dose of *x* rays.

Sodium Citrate.—A. Whitfield[61] found chronic callous ulcers had their borders softened in a week by local application of a solution of salt and sodium citrate.

Silver Nitrate and Strapping.—Gills[25] recommended (1) thorough application of silver nitrate solution 30 grains in 1 oz. (2) Sterile gauze and strapping over. Repeat dressing every other day.

Salvarsan and Neo-salvarsan.—Several cures of ulcers of leg are recorded from injections of salvarsan and neo-salvarsan—for example, Wilkie.[28] Local application of neo-salvarsan is recommended by H. Alston. A single application of neo-salvarsan 1 to 3 of xeroform is lightly sprinkled on ulcer, care being taken that no water touches the surface. The skin round ulcer is painted by tinct. iodi, and the patient to lie in bed for one day, after treatment by xeroform powder.

Toxins of Bacteria.—T. Bukovsky[20] recommends local application of toxins of cultures of *Bacillus pyocyaneus*, but his results were obtained with patient lying up.

Thioform.—J. Schmidt.[79] (1) Cleanse ulcer. (2) Dust thickly with thioform. (3) Cotton-wool and bandage. Change dressing every fourth day. De Buck[81] also recommends it with equal parts boric acid.

Unna's Treatment as described by various Writers.—Hecker.[24] (1) Solution of lysol or chinosol to cleanse ulcer and reduce irritability of surrounding skin. (2) Skin of entire leg cleansed with soap and water, shaving, and then ether to remove fat. (3) Whole leg painted with Unna's zinc jelly, the ulcer being filled to skin level with powdered airol. (4) Ulcer and pressure regions of foot and leg protected by absorbent wool. (5) Double-headed wet starch bandage, 10 cm. wide and 10 metres long, bandaged ankle to foot and back to knee; another similar bandage over this; limb kept horizontal during bandaging and while bandage is drying. (6) Renew bandage if discharge soaks through, otherwise keep on three or four weeks. B. A. Thomas.[76] (1) Cleanse leg and foot with spiritus saponis, alcohol, and hot solution of hydrarg. perchlor. (1 in 2,000 to 4,000). (2) Disinfect ulcer with peroxide of hydrogen and solution of hydrarg. biniodid. (3) Paint on zinc gelatin from ankle to knee. (4) Three or four layers of bandages painted with zinc gelatin. (5) If stickiness is complained of, a layer of shellac over all. (6) Renew two or three times a week. Vorner,[49] Brings,[77] Rosenthal,[78] also, are among the many writers who publish modifications of Unna's classic treatment. Vorner used, instead of the ordinary zinc glycerine gelatin, the following formula: Tragacanth 0.5 per cent., gelatin 10 per cent., glycerine 5 per cent., sod. biborat. 5 per cent., boric acid 5 per cent., water 75 per cent., which after dressing ulcer is melted and painted on leg, and on two layers of bandage. Rosenthal, by means of watch-glasses, has windows in the bandage so as to dress ulcers without removing it.

Vioform.—Piquard[10] recommended: (1) Compresses of hot water, ten to fifteen minutes; (2) ointment 1 of vioform in 40, kept on for two days; (3) later on dust with vioform.

Hot-water Irrigations.—Kindler[6] recommends 2 litres of water as hot as patient can bear poured on ulcer from height of 6 ft., followed by rubbing with iodoform or dermatol. To be repeated two or three times daily. (It is a useful but splashy treatment, which in out-patient departments tries the temper of the nurses.) Veyrasset[7] advises saline 7 in 1,000 at 50° C. for a quarter of an hour daily irrigation until ulcer is quite clean, and then later at longer intervals. A dressing of sterilized gauze between the dressings. Piquard[10] recommends compresses of hot water for fifteen minutes every second day.

Xeroform, Dermatol, Aristol, Loretin, and similar bodies as iodoform substitutes are recommended by many writers.

Zinc Peroxide.—De Beurmann and Tanon.[60] (1) Cleanse ulcer with hydrogen peroxide; (2) 20 per cent. zinc peroxide in white vaseline spread on sterile gauze; (3) renew dressing every third or sixth day.

Other and recent papers on treatment of chronic ulcers of leg are by Lanel,[64] Donnat,[65] Sonder,[67] Mauclaire,[68] Garland,[70] Roos,[71] Boden,[72] Schlegel.[73]

The following are notes on a few treatments I have personally tried, with more or less success:

I.—*Internal Treatment.*

The most valuable drugs are iodides and mercury combined with intestinal tonics—for example, aloin, strychnine, and belladonna pills. My experiences coincide with those of Wilmot Evans,[12] the varicose veins *per se* rarely if ever cause chronic ulcer of the leg. There is invariably some other constitutional condition at work, and this I think is generally syphilis, or in a few cases rheumatic sepsis. W. Evans[13] estimated that 90 per cent. of chronic ulcers are syphilitic; his views when published were challenged by McDonagh[13] and C. F. Marshall[14]. McDonagh found of 65 cases Wassermann's reaction was positive in 15 only. But whether or not the proportion of syphilitic cases is as high as 90 per cent., in my experience at least 90 per cent. of the cases heal more quickly and the cure is more lasting when treated with mercury and iodides. Unfortunately from the methods in which our records are kept and want of time, I cannot give the exact statistics of several hundred cases I have treated at St. Mary's Dispensary. My views as to the greater permanence of the cure by mercury and iodides are supported by the spontaneous expression of the sisters of St. Mary's. These ladies have acted as dressers for twenty or thirty years and also in their work as district visitors keep in touch with the patients after being cured; they all agree that since the routine treatment by iodides and mercury has been adopted the cured patients remain cured far longer and more permanently than in what they describe as the strapping days.

I prefer to give the iodides and mercury together; some authorities do not. For example, W. Evans[12] emphatically says that the iodides must be given alone, and when the ulcer is healed to follow with mercury. I give them together because I do not find much difference in the time taken to heal the ulcer, but I do find that when the ulcer is healed the patient will not return for mercurial treatment. My one and only consolation in cases that take a long time to get well is that it gives the patient an opportunity of a mercurial course of treatment, and that after all the ulcers may be a blessing in disguise by saving the sufferers from later and more disastrous disease.

In my early experience I was very unhappy regarding which cases should have mercury and iodides. I soon found that the old ideas of locality and punched-out look of ulcers was a very uncertain guide, and that a better indicator was the character of the pain. Painful ulcers may be divided into two classes: (1) Those in which the pain is worse when the leg is down, and (2) those in which the pain is worse at night, and becomes severe after the patient has been in bed two or three hours; the latter cases almost without exception are relieved by iodide and mercury, and I think the periostitis in these cases is generally syphilitic. Accumulating experience further showed that a large proportion of cases in which the nocturnal pain is trivial or absent are also relieved by mercury and iodides. Coues[26] advises the leg to be skiagraphed to detect periostitis and if it exists, whether syphilitic or not, to give iodides.

Salicylates.—A few cases where iodides and mercury fail are relieved and the cure hastened by salicylates. These cases usually give a history of previous attacks of rheumatism. I usually give the sodium salt with sodium bicarbonate and direct the patient as to cleanliness of the teeth and mouth.

Acid Treatment.—In a few cases of callous ulcer with extreme brawny hardness extending far beyond the ulcer, I have found benefit by treatment with large doses of citric acid given for four days, followed by the application when possible of Bier's suction cups.

Calcium Iodide and other Calcium Salts.—I have not had great success with this treatment; in a few cases of weak oedematous ulcers with much discharge it has done good work. But I must confess I have not tried it extensively.

Opium I have not found of much good.

Salines.—Small doses of magnesium sulphate several times daily is of marked value in cases where constipation and ulcer with considerable discharge exist.

Iron, Quinine and Digitalis are often required in weak ulcers as symptoms indicate.

Local Treatment.

A. When eczema rubrum complicates the ulcers. If ulcers are acutely inflamed, (1) paint ulcers with solution of anaesthesin and place over them a piece of lint thickly spread with weak starch iodide; paste enough to fill up ulcer, and over all lint soaked in lead lotion. If ulcers are not much inflamed, (1) wrap entire part in lint soaked in lot. hydrarg. perchlor., 1 in 3,000. A few days later replace by 3 parts thick calamine lotion, without lime water, to 1 part lot. hydrarg. perchlor. (1 in 1,000). All lotions without oiled silk, etc., simply bandaged over and changed twice daily; if the lint is sticking, it is to be carefully soaked off. Other valuable lotions: Lot. nigra, as recommended by Purdon[44]; weak boric lotion, 1 to 5 per cent. resorin, recommended by Schaffer[48]; or 3 grams thymol in ʒj lin. calcis, Schaffer.[48] Still later, when redness and scales have subsided, I find Lassar's paste, boric ointment, and vaseline, in equal parts, useful, or, if any pustules exist, 5 to 8 grains hydrarg. am. chlor. in a similar paste. Still later, I fill up ulcer with weak iodoform starch and zinc powder, cover with gauze, and apply Unna's zinc gelatine and bandages. I rather flinch at Unna's method of beginning at the ulcer, and working up up and down with the bandage, and when, as is generally the case, there exist varicose veins about the ankle below the ulcer I bandage from the toes upwards. The jelly and bandage are changed once or twice a week.

Strapping still has a limited place in my practice. When skin is sound I powder ulcer with xeroform, etc., and put a pad of gauze over it. Prominent points are protected by gauze after painting with saturated picric acid solution. Strapping is renewed twice or once a week. For local pain in ulcers of all types I find the drug known as anaesthesin—chemists call it para-amido-benzoic-ethyl-ester, $C_6H_4\langle^{NH_2}_{COOC_2H_5}$—most valuable. This drug was first recommended for ulcer of leg by C. von Noorden[49] in 1902. It was long before I dared to use it on account of its close relationship to orthoform. I used orthoform in several cases, and it was followed by a vesicular dermatitis, and, to my awful distress, in two cases by necrosis of the skin and doubling the size of the ulcer.

J. Noe[50] showed that anaesthesin was much less toxic than orthoform, but it was not until after W. Fackelmann[51] published his statistics of 4,000 separate cases of ulcer of leg relieved of pain without ill after-results that I ventured to use it. Anaesthesin is a solid, very slightly soluble in water, freely soluble in alcohol, and moderately soluble in fixed oils. My favourite solution is 20 grains in ʒj spt. vini rect. I drop or paint it on the ulcer and allow it to diffuse and dry. A single application gives absolute freedom from pain for forty-eight or more hours, and relieves it for six or seven days longer. I have seen no ill result. The spirit produces a few seconds' smarting, but by its affinity for water allows the drug to penetrate; this is valuable when a fetid slough has to be cleansed.

My routine in treating a sloughing stinking ulcer is: (1) Anaesthesin. (2) Douche well with a suspension of terebene in water; this is a good deodorizer, and relieves a sickening duty from its offensiveness. (3) Rub down surface of ulcer with rags soaked in lamp paraffin, and cleanse skin around with same. (4) Fill up ulcer with iodide of starch paste, and spread same thickly on linen and bandage. Renew dressing twice daily.

Lamp paraffin is a very valuable cleanser of old crusts and scales and dried ointments, etc. Saturated permanganate is also useful in sloughy ulcers.

The most useful general application I know for all kinds of chronic leg ulcers—inflamed, weak sloughing, callous, irritable, gummatous, and tuberculous—is an iodide of starch paste. I first learnt the value of this from my friend and teacher, Mr. C. W. Cathcart of Edinburgh, when I was his house-surgeon in the lock wards of the Royal Infirmary, where it was used for sloughy bubonic ulcers of the groin. I think Tilbury Fox was the first to recommend it for venereal ulcers. Years later, when I was appointed to St. Mary's Dispensary for leg ulcers, I tried it, and found that, while it suited many, it caused considerable irritation in others. I then tried it half the strength, and with rather more starch than the original formula, and found it most valuable. Formula: Starch 10.5, glycerine 20.0, water 60.0; boil, and when nearly cold add liq. iodi (*B.P.* 1885) 5.0.

It is applied very thickly spread on, to well overlap the ulcer, and bandaged over. If there is much discharge it should be renewed twice daily; later, once daily or even less frequently. Nearly all cases do well; the pain is lessened or removed in a few days, the hard borders of ulcer soften, the surface is cleansed, granulations form with little discharge and are not irritated. There are a few cases in which it does not suit: (1) In patients with an idiosyncrasy to any form of iodine; (2) in a few cases of intensely inflamed ulcers; (3) in a minority of irritable ulcers about the malleolus in neurotic women; (4) in weak ulcers with very profuse discharge it sometimes liquefies inconveniently and requires frequent changing.

Pancreatic ferments I have not used very successfully, but my colleague Dr. S. B. Figgis has had considerable success with their use in chronic sloughy ulcers.

X rays, in my experience, have failed to do any good.

Zinc ionization has done good after a callous ulcer has been cleansed. I have not used it since I have used anaesthesin; before I concluded that the benefits were not proportionate to the pain of the process.

Tuberculous ulcers and Bazin's disease, in my experience, yield to pot. permanganate solution (3j in 3j) followed by pasta amyli iodidi.

The use of drugs which stimulate epithelial growth on granulating ulcers is rather difficult in out-patient practice. I have no experience with allantoin. The 8 per cent. scarlet-red ointment, even when scrupulous care in directions given to patients, was too strong, and I substituted 5 per cent. The following experiment was interesting: I covered half a healing ulcer with carefully shaped lint with a 5 per cent. scarlet-red, the other half with 5 per cent. amido azotoluol; in twenty-four hours the scarlet-red half was inflamed and painful, the amido half showed no inflammatory signs; and this is practically an epitome of my experience with these drugs. I have now replaced them by a 2 per cent. pellidol, and, as far as a short and limited trial is concerned, I believe it to be far more useful for out-patient work.

In conclusion of these, I fear, rather rambling remarks, I hope that the publication of my now many years' experience in several hundred cases of the pasta amyli iodidi may be of use. I feel justified in stating this from the very large number of letters of inquiry I have had from doctors in many parts of the country, who have seen my patients, as to what is the black paste the patients have told them of.

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DISCUSSION.

Dr. R. MOWBRAY (Castlederg), said he had found that after getting the ulcer more or less aseptic an ointment of zinc oxide with a little sulphur spread on silk tissue to prevent sticking, then covered with lint and fixed in position with an evenly applied bandage, would cure most cases.

Dr. DORE (London) said he would like to thank Dr. Winkelried Williams for his interesting and important paper, and also for the comprehensive bibliography he had supplied. The speaker agreed that iodide of starch ointment was a most useful preparation for chronic ulcers. He would like to inquire as to Dr. Williams's experience of Scharlach R. ointment which was largely used as a stimulant of epithelium, he had used it in several concentrations and had been somewhat disappointed in the results.

Dr. SEMON, in reply to a question from Dr. Mowbray as to a satisfactory and simple treatment for the cure of chronic leg ulcers, said that in Professor Riehl's clinic (Vienna) all such cases were dressed once a day in the out-patient department in the following way: A piece of xeroform gauze, cut accurately to cover the ulcer, was first soaked and rinsed out of weak H_2O_2 solution. It was then spread with an indifferent ointment to prevent sticking, and applied to the ulcer, the margins of which were protected with Lassar's paste. This dressing was covered with lint soaked in lead or aluminium acetate solution (1 per cent.), and prevented from evaporating with oiled paper protective, the whole being then encased in a starch-impregnated gauze bandage. Ulcers in all stages did exceedingly well, and it was only in very septic cases that daily dressings were necessary.

THE USE, ACTION, AND DOSAGE OF *X* RAYS IN PSORIASIS AND OTHER SKIN DISEASES.

By S. ERNEST DORE, M.D., M.R.C.P.,

Assistant Physician for Diseases of the Skin to Westminster Hospital and Lecturer on Skin Diseases in the Medical School.

THE literature on the *x*-ray treatment of lupus vulgaris, rodent ulcer, and ringworm is already extensive, and in this paper I propose to refer to some other cutaneous affections in which benefit may be obtained from *x* rays. Among these may be mentioned psoriasis and eczema, lichen simplex and lichen planus, mycosis fungoides, acne vulgaris and coccogenic sycosis, hypertrophic scars and keloid, warts and thickenings of the horny layer, hyperidrosis, and pruritus.

The favourable action exerted by the *x* rays on so many dissimilar conditions—and the list might be considerably extended—is largely due to the fact that they penetrate the deep as well as the superficial layers of the skin, and have a special action on epithelial and actively proliferating cells.*

There is abundant pathological and clinical evidence of the changes which occur in tissues exposed to the rays. Histologically, the epithelial structures are chiefly affected. The cells of the epidermis undergo various degenerative processes, associated with an increase of kerato-hyalin and of pigment, the latter, according to Scholtz,[1] being especially marked in psoriasis. Degeneration and atrophy of

* For an account of various theories of the action of the rays on the tissues see article on The Rationale of Roentgen and Radium Therapy, by W. Deane Butcher, *Archives of the Röntgen Ray*, June, 1913.

the hair follicles, sebaceous and sweat glands accompany the changes in the superficial layers of the skin. The blood vessels become dilated and vacuolated with proliferation of their endothelial coats. The connective and nervous tissues on the other hand are only slightly affected.

The clinical effect of *x* rays on epithelial neoplasms is well known. The action on glandular tissues is exemplified by the therapeutic effect on the sweat glands in hyperidrosis, the sebaceous glands in acne, the spleen and thyroid gland in leukaemia and Graves's disease, and on the testicles by the production of sterility in *x*-ray workers. The occurrence of telangiectasis after prolonged or repeated exposures of the rays show their marked influence on the vascular tissues. Possibly their reputed styptic action and the early erythema sometimes observed during or shortly after an exposure may be taken to indicate a transient vaso-constrictor and vaso-dilator action respectively. A drying action upon ulcerated surfaces (the reverse of that which occurs with radium) is also very noticeable, although this may be due to static discharges from the tube.

Clinical evidence of the influence exerted on the nervous system is provided by the analgesic and antipruritic effect of the rays.

Selective Action.

Two views regarding the selective action of *x* rays on the tissues may be mentioned. Rowntree[2] examined specimens from cases of *x*-ray carcinoma, and investigated the histological characters of *x*-ray dermatitis in rats, mice, and rabbits. He concludes that the rays are selective, and that moderately large doses cause retardation of cell division and tissue atrophy; small doses, on the other hand, causing stimulation and inducing hyperactivity of cell proliferation. Further, he thinks it probable that a dose just sufficient to induce retrogression of the superficial parts of a growth may, in the deeper portions, stimulate to increased activity.

Hernaman-Johnson[3] admits the selective action and the stimulating effect on normal tissues, but denies the power of small doses to stimulate pathological or embryonic cells. He maintains that Roentgen rays, even in minute doses, are injurious to young cells or to cells retaining the peculiarities of extreme youth, and that a healing rodent ulcer displays destruction of cancer cells probably concidently with increased activity of normal epithelial and connective tissue elements. In support of this contention he quotes the experiments of Dr. Gaskell[4] on the embryos of chicks. Gaskell showed that the *x* rays cause a progressive lowering of the mitotic index—that is to say, the number of mitoses per 1,000 cells in the tissues of the developing embryo, and that there is a critical dose for each embryo, depending upon its stage of development. This critical dose varies with the mitotic index; the larger the mitotic index, or, in other words, the greater the reproductive activity the larger is the dose required to prevent further development. The writer considers that the *x* rays are directly antagonistic to the reproductive activity of the cell and act in such a way as to lower and finally to destroy its power of reproduction. Clinical results seem to me to bear out Hernaman-Johnson's view as to the increased susceptibility of young and rapidly growing cells, and it may be true, as he suggests, that there is a critical dose for each given tumour; but I do not think it follows that rapidly proliferating tissues require correspondingly large doses to inhibit their growth. Experience seems rather to point in the opposite direction. In psoriasis, for instance, the effect of small doses is remarkable. In this and other diseases in which parakeratosis, whether primary or secondary, is a prominent feature, it is probable that the imperfectly cornified and proliferating epidermic cells are in a state of increased susceptibility to the rays and hence react to smaller doses.* The effect of small doses on rapidly growing tumour formations is seen in mycosis fungoides, two cases of which have recently been under the care of Sir Malcolm Morris and myself. In one of these cases half-pastille doses were sufficient to cause resolution of many of the tumours and infiltrations. In some of the sarcomata the same rapid effects are seen. On the other hand, harm may result from large doses in psoriasis, rodent ulcer, epithelioma, and lupus vulgaris, independently of excessive reaction, owing, perhaps, to an injurious effect on the healthy cells and the upsetting of the balance between the normal and the pathological tissues.

The effect of the rays in causing epilation without appreciably affecting the tissues overlying the deep-seated hair bulb illustrates their selective action on the epithelial cells of the latter, which, as regards their activity of growth, are comparable to the cells of a malignant tumour. The abundant regrowth of hair after epilation of the scalp for ringworm, and the regrowth following a Sabouraud dose on a patch of alopecia areata seem to point to a stimulating rather than an atrophic action on the connective tissue papilla. The comparatively small difference between the dose which just fails to cause epilation and that which causes complete loss of the hair, and, again, between the quantity of rays causing temporary and permanent alopecia, is an indication of the difficulty of correctly apportioning the dose when pathological tissues are treated.

The inference I wish to draw from these remarks is that maximum doses are not necessarily the best method of treatment for all cases. We are still ignorant of the pathological data upon which to form a correct system of dosage, but a comparison of clinical results will help us to arrive at an approximate estimate of the quantity of *x* rays which will produce the best results in the various morbid conditions we have to deal with.

Measurement of Dosage.

The pastille of Sabouraud and Noiré affords a useful means for measuring an exact dose of *x* rays, and is now commonly employed as a standard of measurement in this country.

Used under the proper conditions, tint B of the pastille may be taken to represent the maximum quantity of *x* rays which can safely be administered to the healthy skin at a single exposure. It also represents the dose which is just sufficient to cause epilation, or, in other words, the minimum quantity of rays which will cause atrophy of epithelial structures. A fractional part of this may be called a subpastille dose, and a slightly larger amount a superpastille dose. Speaking generally, these may be said to cause stimulation, temporary atrophy, and permanent atrophy of epidermic structures. Radiometers have been constructed to measure fractional doses, but they are apt to be too delicate for practical use, and with a tube providing a fairly constant output,† time measurements give sufficiently accurate results.

Therapeutic Dosage.

Doses representing one-quarter of a pastille may be employed for their stimulating effect on ulcers of various kinds (remembering that malignant or tuberculous ulcers may be healed on the surface without the deep-seated disease being destroyed). In psoriasis and chronic eczema, half-pastille doses seem to give the most satisfactory results. These diseases are superficial, and therefore receive a relatively larger amount of rays, but perhaps another explanation may be found in the selective action of the rays already referred to.

Pastille doses are given when epilation is required as in ringworm of the scalp and beard, favus, staphylococcic sycosis, and some cases of alopecia areata, etc., and for many other conditions in which there is hypertrophy or infiltration of the superficial or deeper structures of the skin.

In warts, corns, hypertrophic lichen planus, hypertrophic scars and cheloid, tint B of the pastille may be slightly exceeded with safety, but in hyperidrosis and acne in which gradual atrophy of the glandular tissues without injury to the healthy skin is aimed at, and in pruritus, pastille doses repeated at intervals of three weeks afford the best method of treatment.

Intensive doses have been advocated for rodent ulcer, squamous carcinoma, myoma uteri, etc., but the advisability of such a procedure is doubtful owing to the risk of setting up a severe dermatitis and of breaking down the

* Since writing this paper I find that a similar explanation of the action of *x* rays on cutaneous tissues has been suggested by Dr. Ulderico de Luca of the University of Rome, Action of the *X* Rays on the Peripheral and Central Nervous System, *Archives of the Roentgen Ray*, June, 1913.

† A hard tube worked with a red anode and an alternative spark-gap of 3 to 5 in., seems to give the best results both in changing the pastille and therapeutically.

connective tissue surrounding the growth. In practice it is safer to give pastille doses at shorter intervals than to extend the dose at one application.

The Treatment of Psoriasis.

The majority of observers who have written on the *x*-ray treatment of psoriasis agree that small doses of the rays cause rapid disappearance of the diseased patches, but that relapses occur as in other methods.

Among recent authors, Tousey[5] says that one dose of 2H for the face, or 3½H for the body is sufficient, or smaller doses may be given and repeated every day at first and later every second day. No inflammatory reaction should be sought. The author's experience indicates that the diseased areas are much more susceptible than the surrounding skin, and that there is an increased susceptibility after the first course of treatment. Smaller doses than usual should therefore be used in recurrent cases. The application should be limited to the areas of disease and a small zone of surrounding skin. The patches clear up in a remarkable manner, areas which have received a sufficient dose disappear completely, while those which have been insufficiently treated disappear incompletely.

Bythell and Barclay[6] state that the rays act rapidly upon psoriasis, the best results being obtained by the use of small doses applied at intervals of a few days. The treatment requires to be repeated, but permanent cases have been published. Curative action is sometimes seen on patches in other parts of the body which have not been exposed to the rays. According to Schultz,[7] recent or old cases of guttate psoriasis are especially favourable for *x*-ray treatment. The small circumscribed areas, up to the size of a halfpenny, often disappear completely after single one-third doses of 7–8 Wehnelt. When such cases have become generalized, the results are equally favourable. The scalp may be successfully treated with divided doses without causing loss of the hair. Psoriasis of the nails, according to this author, is very difficult to influence. In some extensive cases of psoriasis, which in other respects react promptly, a few plaques may remain completely refractory to radiation, although he has not seen individual plaques resist treatment. In the author's cases the refractory plaques were always situated on the trunk, while the sites of election—namely, the elbows and knees—never presented special difficulties. Psoriasis which was refractory to the normal type of radiation did not react to larger doses or to the use of more penetrating rays, and irritation of the skin, set up by the rays, might lead to an increase of the disease. Freund[8] curettes the patches before giving them an exposure of one-third or two-thirds of an epilation dose repeated on four to five successive days. He finds that without a preliminary curettage relapse *in situ* occurs in from six to eight weeks. In 4 out of 7 cases thus treated relapses did not occur over a period of one year; in 3 slight relapses occurred after six months.

My own experience agrees, in the main, with these observers. The *x*-ray treatment is most suitable for obstinate localized patches, and these rarely fail to respond to 3 or 4 half-pastille doses repeated at intervals of a week. Repeated small doses seem to give better results than full pastille doses. Inflammatory reaction is unnecessary and harmful. Extensive areas may be treated by moving the tube in a plane parallel to the surface, so that each area receives an equal irradiation. Acute and rapidly spreading cases are unsuitable. I have not met with the absolutely refractory plaques mentioned by Schultz, and in a case in which the flexures were mainly affected equally good results were obtained. In some disseminated cases relapses have been frequent. In such cases chrysarobin treatment may be advantageously combined with the *x* rays. I have not tried curettage, as advocated by Freund, and the method seems to me to be unnecessarily severe. It is, of course, inadvisable to repeat applications of *x* rays too frequently, and sufficiently long intervals should be allowed to elapse between each series of exposures, but my experience is that even in frequently relapsing cases the disease may be kept in check by small doses without running any risk of *x*-ray dermatitis or of atrophy or telangiectasis of the skin. Patches on the scalp may be treated with small doses without causing loss of hair, but here again recurrence is to be expected. In psoriasis of the nails the penetrating effects of the rays seems to hold out a better prospect of relief than treatment by ointments, but larger doses are required than for the skin. In a case under my care in which the nails only had been affected for several years the hyperkeratosis of the nail-bed was arrested after one pastille dose had been given, and after six doses at intervals of a month the process was checked to such an extent that the new nails grew normally.

Unfortunately the *x* rays cannot be said to confer immunity from recurrence of the disease, but they afford a means not possessed to the same extent by other methods of removing residual patches and possibly of prolonging the period of freedom from the complaint.

The following are a few examples of cases illustrating the treatment of psoriasis and other cutaneous affections by *x* rays. I am indebted to Sir Malcolm Morris and also to Dr. Pringle for sending me many of the following patients and for allowing me to publish the notes.

A male patient, aged 60 years, had suffered from psoriasis for twelve years. There were large thickened patches in the sacral region and on the buttocks and legs and similar patches on both forearms. Half-pastille doses were given to the affected areas on the back and arms and repeated in a fortnight. The patient was seen again three months later, when the patches on the back and arms had completely disappeared, and some patches on the legs, which had not been treated, had also cleared up. Twelve months later there were a few fresh patches on the legs, but the parts which had been exposed to the rays remained free.

A male patient, aged 55, presented numerous large patches of psoriasis on the extensor surfaces of the limbs and on the trunk of several years' duration. All the usual remedies had been tried. Exposures of *x* rays were given every second day for four weeks. The patches were extensive and the tube was moved during the exposures so as to cover as large an area as possible, the lesions receiving about a quarter-pastille dose at each application. The diseased areas gradually lost their scaliness and red colour and finally disappeared altogether, leaving much pigmentation in the areas exposed, but no psoriasis on any part of the body. Three months later the patient reported that, with the exception of one or two small patches on the arms, he had been free from the complaint since he left London.

A female patient, aged 60 years, suffered from psoriasis of the elbows and dorsal and palmar surfaces of both hands. Four half-pastille doses were given at weekly intervals, and a further dose a month later. The lesions completely disappeared, and had not relapsed two years later.

A patient, aged 40 years, had suffered for six years from psoriasis, which was stated to have begun as the result of an injury to the right shin. All the usual remedies had been tried. When *x*-ray treatment was begun, there were large patches on both legs, and numerous small patches on the extensor surfaces of the forearms and scalp. Small exposures were given once or twice weekly for six months, and the patches all disappeared. The patient has suffered from slight relapses since, but the disease has been kept under control by treating the recurrent patches as they appear.

A young woman, aged 21 years, presented characteristic patches of psoriasis on the scalp, trunk, and flexures of the limbs. With the exception of chrysarobin ointment, no treatment had been successful. Small doses of *x* rays were given twice or three times a week to four large patches along the vertebral column and to scattered lesions on the shoulders, and also to patches on the front of the chest, abdomen, and axillae. A few isolated lesions in other parts of the body were treated with chrysarobin ointment. After seventeen exposures, extending over two months, all the patches disappeared, and there has been no relapse for four months.

In chronic eczema of the hands and fingers, *x* rays are often successful where other measures have failed. In a patient who had suffered from a vesicular eczema of the palms and fingers of both hands for six years, the condition yielded to five half-pastille doses of *x* rays. In another patient with dry scaly eczematous patches on the hands and fingers, and the angles of the mouth, the eczema of the fingers disappeared after three half-pastille doses, and the patches at the angles of the mouth after a quarter-pastille dose. Two months later there was a recurrence on the face, the hands remaining well, and three half-pastille exposures were given at intervals of a week. Five months later there had been no further relapse.

Eczema of the nipples is often refractory to treatment by means of ointments. The following cases illustrate the effect of *x* rays:

A female patient, aged 36, had suffered from eczema of the nipples for four years. There were thickened, discharging patches, with a well-defined margin around both nipples, and

extending beyond the areolae. After a few applications of *x* rays the eczema completely disappeared, and the patient remained well for four years. Subsequently two slight relapses occurred, but the disease yielded rapidly to treatment on each occasion.

Another patient suffered from eczema of the nipples and areolae; recovered after three half-pastille doses. Two years later there was a relapse on one nipple, and three more applications were given.

Cases of lichen simplex and chronic lichen planus, including the hypertrophic variety, can be relieved by *x* rays. A case of lichen simplex chronicus affecting the extensor aspect of the left arm was treated with four pastille doses at intervals of about a month. Each application was followed by diminution of the pruritus and thickening, and after the fourth exposure the skin regained its normal appearance.

In a patient with five linear bands of hypertrophic lichen planus, extending across the outer surface of the left arm, which had been present for seven years, the lesions disappeared after three pastille doses.

Hypertrophic scars are amenable to *x* rays. In two patients with raised linear cicatrices on the side of the neck and chin, resulting from operations for tuberculous abscesses, the lesions yielded to pastille doses given at intervals of a month, the scars being completely reduced to the level of the normal skin after eleven applications had been given.

In another patient who had two hypertrophic scars on the cheek and upper lip the lesions became almost imperceptible after six half-pastille doses.

In cases of acne vulgaris and coccogenic sycosis in which vaccine treatment has been tried unsuccessfully recourse may be had to *x* rays, or the two methods may be used in combination. In the persistent nodular type of acne one or two pastille doses are sometimes sufficient, but more often several relapses occur before the lesions are permanently removed. Cases of coccogenic sycosis are benefited by preliminary epilation, and a few pastille doses, repeated at intervals of three weeks or a month, have in several instances proved permanently successful. In severe cases, however, the tendency to recurrence only ceases when the hair follicles have been destroyed—a process which is usually accompanied by atrophy of the skin and telangiectasis. In spite of this drawback, the results of *x*-ray treatment in acne and sycosis compare favourably, in my experience, with those of vaccines. In the following cases *x* rays were employed with satisfactory results:

A lady aged 30 had suffered from constantly recurring subcutaneous abscesses on the nose and chin, for which she had had sixteen injections of an autogenous vaccine without benefit. The lesions relapsed from time to time under *x* rays, but did not recur after five pastille doses had been given.

In a case of extensive acne vulgaris of six years' duration, in which the face, neck, shoulders, chest, and back were affected, the lesions disappeared as a result of *x*-ray treatment extending over several months. Nine months later several fresh lesions recurred on the neck, but these yielded to a few more exposures, the other parts remaining free. This case, which was published in 1907,[9] was seen two years later, and there had been no recurrence of the disease.

A male patient aged 29 years, with coccogenic sycosis of both sides of the face of nine years' duration, was treated with pastille doses on each cheek repeated in two months. The patient then had eleven injections of an autogenous vaccine at intervals of a week, and the lesions improved but did not entirely disappear. Three months later, a pastille dose of *x* rays was given to each cheek. Complete resolution of the lesions resulted, and two years later there had been no relapse.

An obstinate case of sycosis of ten years' duration had resisted various forms of treatment, including the application of pure carbolic acid to the lesions. *X*-ray treatment was adopted, and although there were several relapses, complete recovery finally resulted, although it was attended by slight atrophy and some telangiectasis of the skin. The following case illustrates the effect of *x* rays in hyperidrosis: A hospital nurse had suffered for nine years from severe hyperidrosis of the axillae. Repeated small doses were tried at first without effect. Pastille doses were then given, and after three exposures to each side, the sweating was completely arrested for two years. There was then a relapse, especially on the left side, which was again treated with one pastille dose, and the patient has remained well for two years.

Warts and keratoses are somewhat uncertain in their response to *x*-ray treatment. Much benefit may result in multiple warts of the hands and fingers and in senile warts accompanied by pruritus, but the exposures should not be continued if the lesions do not improve after one or two full doses have been given.

X-ray treatment may be tried in alopecia areata, and I have seen several cases in which it has proved successful. Small stimulating doses are not of much value, but epilation doses to the bald area and surrounding hair are followed by regrowth in the majority of cases. The treatment of single areas does not prevent the formation of fresh patches in other parts of the scalp, but relapses *in situ* are rare. When the disease is extensive, the whole scalp may be exposed as in the treatment of ringworm, but in cases of total alopecia of old standing, the *x* rays, like all other methods of treatment, are of no avail.

In conclusion, it may be said that although *x*-ray treatment is mainly symptomatic, and temporary success is often followed by recurrence of the disease, beneficial results can be obtained in a large number of chronic cutaneous affections which are refractory to other methods of treatment.

References.

[1] Scholtz: *Arch. f. Derm. u. Syph.*, 1902, lix, p. 241. [2] Rowntree: *Lancet*, March 20th, 1909. [3] Hernaman-Johnson: *Proc. Roy. Soc. Med.* (Elec.-Therap. Sec.), March, 1912. [4] Gaskell; *Proc. Roy. Soc.*, series B., vol. lxxxiii, No. B. 564, pp. 305–310. [5] Tousey: *Medical Electricity and Roentgen Rays*, Philadelphia and London, 1910, p. 982. [6] Bythell and Barclay: *X-Ray Diagnosis and Treatment*. 1912. [7] Schultz: *X-Ray Treatment of Skin Diseases* (translated by J. Burnet), p. 117. Rebman Limited. 1912. [8] Freund: The X-Ray Treatment of Psoriasis, *Wien. klin. Woch.*, March 29th, 1913 (abstract in British Medical Journal, July 5th, 1913). [9] Morris and Dore: *Light and X-Ray Treatment of Skin Diseases*. Cassell. 1907.

DISCUSSION.

The President thanked Dr. Dore for his practical contribution on this interesting subject. He had found benefit from small doses of *x* rays in selected cases of psoriasis. He recalled a case which was cleared up by the rays in which a relapse occurred after a few months. Here the internal administration of arsenic brought out an erythema on the patches which had been previously *x*-rayed, a phenomenon which suggested that the rays produced a profound, if not permanent, effect upon the skin.

Dr. W. Griffith (London) said he had had considerable experience of the treatment of psoriasis by *x* rays, and had been disappointed with it because of the frequency with which recurrences took place after the treatment, and because of the danger of telangiectasis if used frequently in chronic recurring cases.

Dr. F. Gardiner (Edinburgh) remarked that *x* rays acted wonderfully well in some cases. They should be kept for chronic cases, but often succeeded when other remedies failed. He had never used previous curettage.

Dr. Semon (London) referred to Dr. Freund's work on the combined use of *x* rays and the curette for the cure of psoriasis. Dr. Freund had personally assured him that the degree of curettage required was of the most superficial character, and hardly enough to inconvenience the patient. He (Dr. Freund) had used it now in several chronic cases, in the majority of which the plaques so treated had not recurred after eight to twelve months, whereas those not first scraped had soon relapsed.

Dr. Dore, in reply, said that he did not wish to advocate *x*-ray treatment for all cases of psoriasis, but there were certain cases in which it was advantageous, and it also gave the patient a better chance of getting rid of all traces of the disease than other methods, and probably therefore of remaining free from relapses for longer periods. He had never seen any harmful results; but the rays must, of couse, be used with the greatest circumspection.

TREATMENT OF COMMON SKIN DISEASES AT THE HARROGATE SPA.

By L. J. Hobson, M.D.Lond., F.R.C.S.Eng.,
Consulting Physician, Harrogate Royal Bath Hospital.

Although the date of the discovery of the sulphur springs at Harrogate is wrapt in obscurity, as early as 1626 three of such springs in the vicinity were described, and one of these was apparently what is known as the Old Sulphur Well. They were drunk by the common people, and were

said to "soon help and cure by washing and bathing, itch, morphew, tettars, ringworm and the like"; and even earlier still sulphur waters were used to cure ulcers and sores, when seemingly reckoned too offensive and too dangerous for common use. In 1656 baths were introduced, as coffin-shaped tubs, in the various inns and lodging-houses, so that "twenty bathing-houses kept them all full employed in the season." At this time precise directions were first given by the physician for the rational use of sulphur waters internally, in seasons, times of day, and dosage.

ADVANTAGES OF SPA TREATMENT.

1. *Generally.*—A patient is sent away from home, at some sacrifice, to go through a treatment elsewhere, quite out of the common. Inspired with hope he accepts, in a new environment and in minute detail, a regimen such as he would be unlikely to have readily submitted to at home, where but too often the means of a cure take a place only secondary to the routine of daily life, and receive but a half-hearted acquiescence much against a successful issue.

2. *In Particular.*—Harrogate has special claims for choice:

(*a*) Its long-established reputation for the cure of skin diseases.

(*b*) The ample variety of its mineral springs adaptable for internal or external use, or both.

(*c*) The powerful quickening of tissue change, effected by the waters and baths, is assisted by the influence of the dry and pure invigorating upland air, which stimulates the functions of the skin and the digestive and assimilative processes. Oxidation and elimination of waste products coincide with a rebuilding of tissue, insomuch that physical and nerve tone are alike enhanced, and in such degree that, at the conclusion of the course, no after-cure elsewhere is required.

(*d*) The supplementary advantages of other treatments obtainable here, and the better response to ordinary remedial agents, formerly perhaps slow in action or almost inoperative.

SELECTION OF SUITABLE CASES AND STAGES OF DISEASE.

The greatest success from the spa treatment is to be met with in the more chronic ailments of the skin, or where the stage of greatest activity has passed, and where no serious disease of heart or kidneys interferes with the course.

The skin diseases most commonly and effectively treated at the Harrogate Spa are eczema, psoriasis, lichen, acne, lupus erythematosus, furunculosis, erythema, syphilides, and certain neuroses.

TREATMENT.

Eczema.—Among skin diseases likely to benefit at the Harrogate Spa eczema has been from the earliest times pre-eminent. At the Royal Bath Hospital alone, where cases of eczema (next to rheumatic cases) always head the list of diseases treated, there have been as many as 215 cases dealt with in one year, and ever since this Charity came into being in 1824 its reputation for the cure of eczema, psoriasis, and other chronic skin diseases has been unrivalled in the provinces.

The treatment of eczema is partly (1) *local*, while eliminating sources of irritation; partly (2) *general*, in the correction of any existing impairment of health, our object being to attack any digestive, assimilative, or nervous fault, while removing from the system the toxaemic products of imperfect digestion, via the liver and bowels, skin and kidneys, and at the same time to raise general nutrition and nerve tone to the highest perfection attainable.

The waters internally have their corrective and eliminative, or their tonic, action, as a sulphur or a chalybeate course may be specially indicated. Where the stomach is mainly at fault, the alkaline sulphur waters may have their place; where, however, the liver, bowels, and kidneys need stimulating, the saline sulphur waters, strong and mild, are ordered, and it is here that the Old Sulphur water (our strongest spring) is a sheet anchor, its effects being most pronounced in cases of loaded system, a disordered liver, and dyspepsia with constipation, where the functions need rousing, and particularly in gouty and lithaemic conditions.

The mild sulphur waters are tonic to the stomach, and these include the Magnesia water, with its pronounced diuretic action, useful in renal torpor alone, and as an auxiliary to the aperient strong sulphur water where the system needs a thorough depuration. For their generally tonic action, among the saline-chalybeates, the water most valuable is the Kissingen spring; this is in full doses a tonic aperient, and often usefully follows on a preliminary sulphur course. The pure chalybeates have their place in simple anaemia and debility, especially in children. For bathing purposes there is choice of the alkaline sulphur baths (Beckwith and Harlow Car), and the saline sulphur baths, strong or mild; the former safest at the commencement, being the more sedative and fitting in the stage of declining hyperaemia, with itching of skin rather than smarting; the latter with their more stimulant action, indicated where there is dryness and scaliness of skin rather than crusting, and a more quiescent or chronic stage.

The temperature of the baths, their duration and frequency, are all important factors, and the opportunity is afforded by their use for the softening and removal of crusts and scales as a prelude to the efficient action of local applications.

Acting also as mechanical and thermal stimulants, a decided effect is produced by the baths upon the cutaneous nerves and vessels of the skin in the affected parts, which at first rosy, from heightened capillary action, subsequently show a more natural colour; itching is relieved, the skin becomes softer, its repair encouraged, and with lessened general irritability rest and sleep are the better secured.

The more chronic the eczema, the more dry, scaly, and infiltrated the skin, the more striking is the issue from the course.

Psoriasis.—In ordinary cases we have three indications in treatment: (1) To correct any attendant disorder of health; (2) to macerate and detach the scales; (3) to remove the chronic inflammatory condition of the papillary layer with its hyperaemia. (1) For cases where there is any gouty or plethoric condition, the sulphur waters, strong and mild, are applicable, both for their action upon the liver and bowels, and for their diuretic effect and consequent relief of vascular excitement. For a quiescent eruption, with only anaemia or want of tone generally, the chalybeates are the more indicated. For (2) and (3) the sulphur baths, in various strengths impregnated with sulphur and salines, soften and detach the scales, allay irritation, and stimulate the papillary layer; there is relief of hyperaemia, and with the removal of scales, suitable medicaments have their quickest and most penetrating effects upon the disease. Where there is a widespread eruption, the peat baths, which may be made with sulphur water, have a preference; this bath retains its heat more, and can be for longer given with advantage. In the restricted periods usually allowed for spa treatment, the use of drugs is best avoided, and the waters and baths allowed to have their uncomplicated play. With improved health and nerve tone, we witness a steadily fading eruption, and often a cure, even in old-standing psoriasis.

Lichen.—Here again we may improve general and nervous tone by a chalybeate course or in some cases, for diuresis, order the saline sulphur waters. To relieve the hyperaemia and itching of skin, the mild sulphur baths are well given before local remedies are applied.

Acne.—In common acne, the poor digestion and circulation are favourably influenced by the sulphur waters internally, especially where constipation exists; where, however, there is simply anaemia or menstrual disorder, a chalybeate course is preferable. Externally the glandular functions are stimulated by ablutions of sulphur water, and the sebum softened and expressed from the follicles, and in so far the way is prepared for the better action of lotions and other usual applications. Cases of acne vulgaris are usually curable by spa treatment without resort to vaccination. In acne rosacea a course of sulphur waters has special applicability for correcting the digestive functions and unloading the liver and bowels.

Lupus erythematosus in its limited and superficial form is found to respond well to treatment at Harrogate, with its tonic air and chalybeate waters, assisted perhaps by a

daily local d'Arsonvalization with the glass vacuum tube and short spark gap.

Furunculosis is generally associated with impairment of health, which may be the result of the absorption of products of imperfect digestion, and is well treated by the aperient and diuretic sulphur waters (with or without intestinal lavage), and a local treatment of the boils.

Erythema in its common local form of intertrigo, which so easily passes into an eczema, and in its more general form, some gouty or rheumatic condition may underlie it, and be amenable to the saline sulphur waters for their aperient and diuretic action, and to the baths when the disease is in the stage proper for their exhibition.

Urticaria, in its chronic form often gouty or gastro-intestinal in its origin, with an abnormally excitable nerve irritability, is well treated by a carefully adjusted dietary, and by sulphur waters, alkaline or saline, to correct digestion and to open up the channels of elimination. Alkaline sulphur baths soothe the irritable skin, and prelude the application of various antipruritic applications.

Syphilides, of the squamous and papular kinds, are treated specially by the alkaline sulphur baths at Starbeck, where their use is well supplemented by a full course of the sulphur waters, and where mercurial inunctions after each bath are given, as at Aix.

Neuroses.—In every case of pruritus we have to correct any internal causes, which may be an overloaded system with hepatic or digestive disorder, for which the saline sulphur waters are applicable where the kidneys are sound. The baths, alkaline or mild sulphur, given at a moderate temperature, often have a soothing action upon the irritable cutaneous nerves.

Auxiliary Treatments.

These deserve some final attention, although in some directions already touched upon.

Electricity, as high-frequency currents, is in many cases a useful supplement to baths and waters. In the form of "autocondensation" it is a nerve tonic; locally, the "effleuve" with the glass vacuum electrode is useful in some dry eczemas, and also in psoriasis, where patches are of some extent but limited in number; also it relieves certain local pruriginous troubles, particularly pruritus ani.

Intestinal lavage (Plombières method) with alkaline sulphur water, is a good adjunct in those cases of skin disease where absorption of toxins from the bowel is suspected, as in certain cases of eczema, boils, urticaria, and general pruritus.

Turkish and vapour baths may be of assistance in seborrhoea and acne, as well as in other cases where sulphur baths alone do not afford the requisite diaphoresis, and for these *electric-light baths* may be an alternative.

The *Needle and Vichy massage-douche baths* are good in some cases to improve general and vasomotor tone, as in acne, lupus erythematosus, and some neurotic skin affections.

X-ray treatment is not at present available at our baths.

In concluding my preliminary historical remarks, I might have noted that it was as recently as 1832 that our first bathing establishment was built, the Old Victoria Baths.

In 1811 a Mrs. Hofland versified the erstwhile balneological amenities of "A Season in Harrogate":

> Astonished, I saw, when I came to my doffing,
> A tub of hot water made just like a coffin,
> In which the good woman who attended the bath
> Declared I must lie down as straight as a lath,
> Just keeping my face above water, that so
> I might better inhale the fumes from below.
> "But, mistress," quoth I, in a trembling condition,
> "I hope you'll allow me one small requisition.
> Since Scrophula, leperasy, herpes and scurvy,
> Have all in this coffin been rolled topsyturvy,
> In a physical sense I presume it is meet,
> Each guest should be wrapped in a clean winding sheet?"
> "Oh no! my good sir! for whatever your case,
> You ne'er can catch anything bad in this place,
> And your being settled on solid foundation,
> We Harrogate bath women spurn innovation.
> So caveller like I submitted to power,
> And was coddled in troth for the third of an hour."

DEMONSTRATION.

Before the discussions commenced on Wednesday and Thursday Dr. Winkelried Williams (Brighton) demonstrated a series of cases.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

VACCINE TREATMENT IN BUBONIC PLAGUE.

During the twelve months ending April, 1912, in applying the vaccine treatment in plague the peripheral blood of every case was systematically examined by a simple bacteriological method (by culture) at the bedside just before injecting the vaccine. In this detail, as well as in the quality of the vaccine employed, the present observation differs from that of 1907,[1] where, with Dr. D. A. Turkhud, I applied the vaccine treatment in plague. The main features of the vaccine used in this year's observation are (1) that it was prepared from the first subcultures of rich growths on agar of peripheral bloods of virulent septicaemic plague cases, and therefore was abundant in the glutinous globulin characteristic of such cultures—the properties of the thin globulin-like protein has been described by the author elsewhere[2]—(2) that owing to the application of glycerine (and not of heat or Na_2So_4) in sterilizing the culture emulsion the vaccine contained only soluble immunizing substances and was free from coagulation and precipitation products, and, being stale (at least three months), was probably free from the toxic substances which Rowland[3] had described as being present in fresh emulsion of plague cultures before they are destroyed by the coexisting proteolytic enzyme, also described by the same author; (3) the dose of vaccine administered corresponded, as a rule, to $\frac{1}{100}$ agar tube and by computation to the glutinous products of about 75 to 80 million bacilli. Even double this dose has been borne well; only one injection was given at the earliest opportunity.

In every case the blood was obtained by a needle-prick of the finger tip and taken up with a straight glass pipette and planted straight on to a dry surface of an agar tube. With the ordinary sterility available with ether alcohol for the finger and spirit-lamp heat for the needle, pipette, etc., not a single contamination was found in all the cases observed. This culture method, in the author's opinion, was, for all practical purposes, quite a good index as to the non-septicaemic or septicaemic nature of the case, not a single colony being detachable even after a week in the former group, which colonies were demonstrable in about thirty-six hours in the latter group of cases.

The number of cases in this observation is small and the value attachable to a computation of a percentage is greatly lessened, but the uniform reaction obtained after twelve to twenty-four hours of the vaccination in all cases, and the uninterrupted progress of a great proportion of the non-septicaemic cases appeared to justify a record of the figures.

Total Number of Cases Treated, 87.

	No.	Recovered.	Percentage of Recoveries.
Non-septicaemic ...	44	35	79.5
Septicaemic	43	0	0

These figures speak for themselves, and might be taken as an indication to continue the observation.

Bombay. R. Row, M.D., D.Sc.Lond.

[1] Row and Turkhud: Effect of a Salted Plague Toxin used as a Vaccine in Man. *Bombay Physical and Medical Society's Journal*, July, 1907.

[2] Row: Some Properties of a Plague Toxin, with Special Reference to a Salted Plague Vaccine. Ibid., April, 1907.

[3] Rowland: *Journal of Hygiene*, Plague Supplement, fifth and sixth report. 1911 and 1912.

Reports
ON
MEDICAL AND SURGICAL PRACTICE IN HOSPITALS AND ASYLUMS.

GENERAL INFIRMARY, LEEDS.

A CASE OF SEVERE INTRAPERITONEAL HAEMORRHAGE FOLLOWING CHRONIC PERFORATION OF A GASTRIC ULCER.

(Under the care of H. COLLINSON, M.S., F.R.C.S., Honorary Assistant Surgeon.)

ALARMING haematemesis and melaena as the result of the erosion of a large vessel by gastric ulceration is a common experience, but I have not been able to find any record of a case in which the haemorrhage has been entirely intraperitoneal, as in the instance which I am about to quote:

On September 17th, 1912, I was asked to see a married woman of 35, in consultation with Dr. Welch of Stanningley. The history was briefly as follows: For several years the patient had been troubled with indigestion, and rather more than two years before, whilst in America, an abdominal operation had been performed, but she could not say what had been found nor whether anything more than an exploration had been made. Since that time she had had considerable pain after food, and occasional vomiting, but had been under no regular medical treatment.

On the morning of September 17th she was seized with violent pain in the epigastric and left hypochondriac regions and vomited once, the vomitus consisting of food. When I saw her at about 10 p.m. she was lying in bed with the knees drawn up, groaning with pain. Her face was pale and agonized in expression, but her friends stated that they did not think she was paler than usual. Temperature was subnormal, pulse 120. Abdominal examination showed considerable rigidity of the recti muscles above the umbilicus, and in the left hypochondrium an ill-defined tumour could be felt; the boundaries of the swelling were not sharply defined, but it evidently extended beneath the costal margin and appeared to occupy the position of the lesser sac of the peritoneum; percussion over it gave a slightly resonant note. There was no dullness in the flanks and no diminution of liver dullness. The abdominal wall below the level of the umbilicus was scarcely at all rigid.

The diagnosis appeared to lie between perforation of a gastric ulcer into the lesser sac and acute pancreatitis, and operation was advised.

Operation.

The patient was moved to hospital as soon as possible, and operated upon early the following morning.

A median incision was made above the umbilicus. On opening the peritoneal cavity a quantity of blood was visible amongst the intestinal coils; the cardiac portion of the stomach was pushed forward close up to the anterior abdominal wall, and on passing the hand round the fundus the gastro-colic and gastro-splenic omenta were found to be tightly stretched over a mass occupying the lesser sac. The lower part of the abdomen was protected by swabs, and an opening made into the lesser sac through the gastro-colic omentum; the mass behind the stomach was then found to consist of a large quantity of blood clot. This was all cleared out and the cavity wiped clean.

No further haemorrhage occurring after the evacuation of the clot, a search was made for the origin of the bleeding, and on the posterior wall of the stomach there was found to be a perforation about the size of a sixpence, with indurated margins; at a point in the upper border of the pancreas corresponding to the perforated ulcer was a small excavation with some surrounding infiltration. No open vessel could be seen in the floor of this ulcerated area, nor was any bleeding occurring at the time, but as it appeared probable that the haemorrhage had come from one of the smaller branches of the splenic artery in this situation, the margins were approximated as closely as possible by a couple of catgut sutures, under-running the base of the ulcer. The margins of the perforation on the posterior wall of the stomach were freshened and the opening closed by interrupted sutures. A posterior gastro-enterostomy was rapidly performed, a dental rubber drain passed into the lesser sac through the opening in the gastro-colic omentum and the abdominal wound closed. Recovery was uneventful.

The case is interesting both on account of its rarity and from the point of view of diagnosis. There was no haematemesis at any time although there was very profuse haemorrhage from somewhere in the floor or margins of the ulcer; the acuteness of the pain and its sudden onset were highly suggestive of acute perforation of a gastric ulcer, and yet the extent and degree of abdominal rigidity were less than one usually finds in such a case.

The situation of the tumour suggested an effusion into the lesser sac but its extremely rapid development was contrary to what one would expect either in acute perforation of an ulcer on the posterior wall of the stomach or in acute pancreatitis.

The explanation of the condition appears to be that a branch of the splenic artery in the margin of the ulcer was eroded, this produced a sudden and profuse haemorrhage which was sufficient to separate the stomach from the pancreas at this point, as a consequence blood was effused into the lesser sac and not into the stomach, and as the amount increased the stomach was pushed further forward and its cavity obliterated. Whether the ulcer was entirely separated from its posterior attachment by the pressure of the effused blood or during the operative manipulation it is impossible to say.

British Medical Association.

CLINICAL AND SCIENTIFIC PROCEEDINGS.

GIBRALTAR BRANCH.

A MEETING of the Gibraltar Branch was held in the Royal Naval Hospital on October 4th, Deputy Surgeon-General W. W. PRYN, R.N., President, in the chair. Dr. LYONS demonstrated a case of *Leucoderma*, and made a few remarks on the present state of knowledge regarding the condition. The PRESIDENT demonstrated the Edridge-Green *Lantern for testing colour vision*, and showed how the test should be carried out in practice. He also explained Holmgren's method of testing colour vision by means of wools. Dr. LOCHHEAD showed a patient operated on for *Multiple hydatids of the peritoneal cavity*, and read notes of the case and of a second case of removal of a hydatid cyst from the root of the neck. Major WANSEY BROWNING gave a lantern demonstration to illustrate the distribution of the *Rash in small-pox*, and showed how it differed from chicken-pox and such conditions as dermatitis and impetigo.

Council.—At a meeting of the Branch Council, held on the same day, Colonel Maher, R.A.M.C., was elected to the vacancy on the Council caused by the departure of Colonel Johnston, A.M.S., from Gibraltar.

Reports of Societies.

ROYAL SOCIETY OF MEDICINE.

CLINICAL SECTION.

AT a meeting held on October 10th, Mr. CHARLES J. SYMONDS, President, being in the chair, the following were among the exhibits:—Dr. J. D. ROLLESTON: A case illustrating the value of salvarsan in the local treatment of *Vincent's angina*. The patient was a man aged 20, with well marked ulceration of the right tonsil from which the characteristic organisms were grown. Other measures having failed, a throat swab moistened with glycerine was dipped in salvarsan powder and rubbed over the affected area. Four applications were made in this way and resulted in a rapid healing of the ulcer. Mr. G. H. MAKINS: Case of *Actinomycosis* of the cheek treated by parenchymatous injections of formalin. The patient was a boy aged 17, and the condition had progressed until four discharging sinuses were present. After treatment with potassium iodide, two hypodermic syringefuls of a 4 per cent. solution of formalin were injected around the periphery and into the margins of the area. Four subsequent injections were given, and each was followed by local oedema. When shown the cheek was nearly normal. Mr. T. H. KELLOCK: A case of complete destruction of a part of the diaphysis of the tibia by acute *Osteomyelitis* in a boy aged 8; also a case of *Osteogenesis imperfecta* with multiple fractures in a boy aged 11½. Skiagrams showed the long bones to be more translucent and to contain less compact tissue than normal. Spontaneous fractures were seen in the tibiae, radii, and ulnae, with practically no displacement of the fragments. Dr. W. ESSEX WYNTER: Two cases of *Splenic enlargement* associated with haemorrhage, anaemia, and oral sepsis, one in a man aged 50; the other, in which arteritis

obliterans was also present, in a woman aged 55. Sir Frederic Eve: A case of *Angioma* of the synovial membrane of the elbow in a girl aged 11. The chief interest of the condition lay in the diagnosis from localized tuberculosis of the synovial membrane. This, he thought, might usually be made by observing the changes in the swelling induced by alterations of the venous circulation. Also a case of Bazin's disease in a woman aged 31. Mr. P. P. Cole: A *Myxochrondroma* of the thigh in a man aged 45, following a fracture of the right femur which had failed to unite completely. The circumference of the thigh at the situation of the swelling was 22½ in. Dr. A. F. Hertz and Dr. W. Johnson: A case of *Bilateral atrophy of the face* in a man aged 38. He showed well-marked signs of chronic lead poisoning, and no other cause for the condition was discoverable. Mr. H. Gardiner: (1) A man, aged 42, with destructive *Arthritis* of the right wrist, which was entirely painless. Sensation to heat and cold was absent, and muscular and tactile sensations were also slightly affected. (2) *Bilateral cervical ribs* in a woman aged 17. A weakness had been noticed for three or four years, and was increased by much piano playing. Dr. H. D. Rolleston and Mr. E. F. W. Grellier: A case of *Unilateral clubbing of the fingers* due to axillary aneurysm in a man aged 63. The blood pressure and the pulse tracing of the radial artery on the affected side were similar to those on the normal side.

Reviews.

MEDICAL HYDROLOGY.

The therapeutic uses of water charged with varying degrees of mineral matter in solution have been the subject of discussion amongst medical men of all nationalities for many centuries. The successes that have been achieved have led to many enterprises, many of them more commercial than scientific, intended to popularize a form of treatment that carries with it a considerable amount of personal comfort. The more thoughtful of spa physicians have from time to time endeavoured to place the whole object upon a more scientific basis, and have tried to give a rational explanation of the phenomena they have observed. But practical experience has proved both to them and to their patients that even the most authoritative rules are subject to so many exceptions that there is no royal road to cure, but that there must be a certain amount of experiment in each individual case. Experience, however, if it throws doubt upon the infallibility of rules, must of necessity lead to a very full acquaintance with exceptions, and hence the considered opinions of a well-qualified spa physician are worthy of careful study.

A comprehensive treatise on *The Principles and Practice of Medical Hydrology*,[1] from the pen of Dr. Fortescue Fox, has recently appeared, in which the whole science of treatment by waters and baths is dealt with in a thoroughly scientific spirit. The writer is evidently conscious of the limitations of precise knowledge as to the mode of action of these agents, and, like many others of equal experience, he has found that a mysterious difference exists between the natural water containing salts and an exactly similar chemical compound synthetized in the laboratory. "Science," he remarks, "is everywhere bounded by the unknown," and he evidently recognizes that the boundary is very soon reached when attempts are made to account for some of the results obtained at medicinal springs.

Theory has been active of late years. The possibility of the presence of metals in a colloidal condition, defying detection by ordinary analysis, has been assumed, and still more recently the possession of radio-activity has been attributed to many of the alkaline waters of this and other countries. Neither of these hypotheses are as yet capable of satisfactory proof, and it is still necessary to fall back upon the teachings of experience for guidance as to the practical employment of baths and waters for the relief of disease. One quality, however, has been clearly established—namely, the varying tonicity of waters with different chemical composition. Their osmotic behaviour is capable of demonstration, and may be held to explain their more rapid action in certain cases.

Dr. Fox's book is comprehensive. Without assuming too enthusiastic a tone he carries his reader with him by the sounder method of convincing argument, founded on observation and a strong belief in the clinical wisdom of many of the older writers, whose teachings are as worthy of respect at the present time as they were in the past.

The skin is an organ with very complex relations, and it is not usually treated with the care that it deserves where the use of baths is concerned. A cardinal point that has always to be borne in mind when the use of heat and cold to the skin is in question is the fact that temperatures above or below a certain point must produce circulatory and nervous variations. At or about 93° F. no such changes occur, but this fact is entirely unknown to most people, or is too often disregarded. The results of such ignorance or disregard have often to be suffered by young children who, as a rule, are subject to far more immersion than is consistent with robust health. The excessive use of soap in infancy is, in Dr. Fox's opinion, a common cause of delicacy owing to the unnecessary frequency with which the natural secretions are removed.

By far the greater number of cases calling for treatment by baths and mineral waters are the chronic affections in which metabolism is persistently obstructed by the presence of the results of local disease or of defective digestion. Hence gout and rheumatism in their protean forms have mainly to be considered, and a good deal of space is devoted to the means that have been employed for their relief. The whole book may be commended as a most useful and trustworthy guide to the use of baths and waters, and it may be especially directed to the notice of medical men in charge of spa establishments. The spa physician is in the peculiar position of a specialist who has had no special training beyond the gradual experience gained in his work, and in one of his final chapters the writer points out the qualities that make for success or failure in this special line of practice.

A plea is made for better nomenclature in place of the somewhat unsatisfactory terms of hydrotherapeutics and balneology, and the writer urges the adoption of the title medical hydrology for a branch of medicine which is deserving of more serious study than it has hitherto obtained.

TRAUMATIC NEUROSES.

Now that most of the civilized countries of the world have passed workmen's compensation acts in one form or another, the problem of the immediate and remote effects of injury has become one of increasing urgency and practical importance. How far are the symptoms and signs the direct result of the injury? How much is genuine, how much simulated? How much malingering? These are questions which crop up at once in all these cases, and the solution may demand the highest acumen and the greatest experience. The fact that some kind of indemnity looms ahead in nearly every case is no small factor not only in causing the symptoms to continue but even in originating them. The enforced idleness, not always entirely due to the accident itself, but sometimes caused by delay in settlement, helps to keep up the morbid condition. The average workman speedily becomes demoralized by such compulsory idleness, and this is one of the elements in favour of capital payment as against the instalment system. There is evidence that in countries—for example, Germany—where the instalment system of payment prevails, there is considerably more traumatic neurosis than in countries where a mixed system obtains. It is not easy to lay down general laws on the subject. Much may be said for either system, but where possible Professor Salmon, the author of a valuable recent contribution to the elucidation of this subject,[2] argues in favour of payment by a lump sum, each case being judged on its merits.

When one reads the long list of neuroses, both organic and functional, which have been attributed to traumatism, there seem to be few diseases which have not been traced with more or less accuracy to injury. Professor Salmon

[1] *The Principles and Practice of Medical Hydrology.* By R. Fortescue Fox, M.D.Lond., F.R.Met.Soc., late Hyde Lecturer in Hydrology, Royal Society of Medicine. London: University of London Press; Hodder and Stoughton, and Henry Frowde. 1913. (Demy 8vo, pp. 309. 6s. net.)

[2] *La Neurosi Traumatica.* Del Professor Alberto Salmon. Turin: Unione Tipografico. 1913. (Roy. 8vo, pp. 219.)

does not believe that traumatic neurosis is a disease *sui generis*, although cases have qualities which seem to give them a special clinical note, the chief being the crystallization of the symptoms and signs about the injury from which everything seems to start, and to which everything points in the patient's mind. When he comes to prognosis, like most authorities of experience, Professor Salmon is inclined to give a very reserved opinion, especially after head injuries. The effect of settlement is often so magical that this is one of the strongest arguments for payment by a lump sum rather than by instalments. Some wise remarks are made as regards prophylaxis, especially as to the importance of cultivating a well-balanced mind and restraining the emotional elements. Perhaps in dealing with a question like traumatic neurosis, where so much may happen, it is difficult to avoid what looks almost like hedging, or making a book seem very much like a glorified catalogue of nervous diseases; for the long lists of diseases given, on good authority, create the impression that almost anything may happen. However, in spite of his long catalogue of woes, the author evidently possesses a saving common sense which enables him to steer safely through his troubled sea. When all is said, each case has to be judged not on general lines but in view of his or her peculiar history, whether personal or family.

MURPHY'S CLINICS.

WE have pleasure in again calling attention to *The Surgical Clinics*[3] of Dr. JOHN B. MURPHY, of Chicago. They cover a wide range in surgery and in some recent issues contain "clinical talks" by visitors on subjects with which they are known to be more or less identified. These interludes are interesting in themselves and also for the certain element of contrast in style introduced, but we feel compelled to protest against the reproduction in cold type of the fine things the host and guest have to say about one another in mutual admiration. The real value of publications of this sort is the opportunity they give of taking part even at second hand in a clinical demonstration by such an acute-minded surgeon and stimulating teacher as Dr. Murphy. The *Clinics* would, we think, be improved if the series of questions and answers between Dr. Murphy and the sometimes rather unfortunate intern were left out, and if we had only Dr. Murphy's racy and critical talk. A direct transcript of the shorthand note of a conversation is apt to make weary reading. The dramatic author knows this, and to get the effect of natural conversation, while keeping his play moving, he has constantly to condense, and part of his art is to do this without on the one hand being stilted and so destroying the illusion of reality, and without on the other hand leaving the audience in doubt as to what is meant.

We observe with interest that the dressing employed in bone and joint work is almost invariably 5 per cent. carbolic gauze applied moist—a curious reversion to original Listerian recommendations. The object is to make doubly sure of asepsis of the wound. Murphy holds that asepsis sufficiently rigorous for the peritoneum is not quite good enough for bones and joints; it must be hyperperfect to attain the certainty of results required. This was taught years ago by Edmund Owen and Robert Jones, whose work is deservedly acknowledged by this author. Similarly he follows Macewen's teaching on the function of periosteum as a limiting membrane simply. The close relationship of accurate pathological knowledge to correct surgical treatment appears strongly in every case. We appreciate very highly Dr. Murphy's habit of pointing out the analogies between conditions in which analogy has not been generally observed; for instance, a gangrenous appendix is pathologically analogous to the necrosis which occurs in acute osteomyelitis, and the same early energetic treatment is required in both cases.

Another volume contains reports on some rare tumours: desmoid tumour of rectus abdominis, paratracheal tumour, and infectious granuloma of caput coli. A very important feature is a clinical lecture by Dr. F. H. Albee, of New York City, on his method of treating—indeed, curing—Pott's disease of the spine by inserting a bone graft from the tibia into the spinous processes split to receive it. This method was spoken of more than once at the International Medical Congress, London, and aroused the liveliest interest. Those of our readers who are not likely to obtain the transactions of the Congress would do well to consult the June issue of Dr. Murphy's *Clinics*.

The August number is the most important yet issued. The first paper is on vaccines and serum-therapy, by Dr. Kreuscher, of Murphy's Clinic, followed by a report of the discussion upon it in the Chicago Medical Society. Dr. Murphy's comments and explanations of the nature of vaccines and serums are lucid, without any attempt at an elaborate explanation. The general trend of opinion is in favour of their use, and in favour of autogenous as against stock vaccines—that is, in favour of closer individualism in treatment. Following this paper is a beautiful series of skiagrams showing the blood supply in and around many of the important joints. They are the work of Dr. G. W. Hochrein, radiographer to the Murphy Clinic. The object of these is mainly to "aid in determining the position of the flap pedicle used in arthroplasties." The cadavers were injected with red lead emulsion, which found its way into the most minute arterioles. We have never seen anything so exquisite as the skiagram of the foot with the blood supply of the heel and sole clearly shown. It is quite comparable in excellence with the famous Hunterian injection of the pia-arachnoid vessels.

The general style of the *Clinics* is being improved. The author has dipped more deeply into the pathological and philosophical aspects of his cases. He has also dipped into the past, and reprinted a paper of twenty-five years ago on appendicitis, entitled On Early Operation in Perityphlitis. In this paper it will be seen what remarkable foresight he possessed, as the views advocated there are precisely those of to-day, and the treatment he prophesied has actually become the universal daily practice.

[3] *The Surgical Clinics of John B. Murphy, M.D.*, at Mercy Hospital, Chicago. Published bi-monthly. Philadelphia and London: W. B. Saunders and Co. 1913. (Roy. 8vo, pp. 352. 35s. net a year.)

UROLOGY.

THAT a period of nearly eight years has elapsed since the appearance of the first edition of Professor LEOPOLD CASPER'S *Lehrbuch der Urologie*[4] is an indication rather of the author's modesty than want of progress in this branch of surgery. Urology is at present probably studied as a speciality more on the Continent than in this country, but we are quite entitled to claim no lack of interest in the subject. Surgeons on the whole regard the surgery of the genito-urinary tract as part and parcel of everyday surgical work; it does not appeal to the average man as a room in the surgical mansion in which he would like to shut himself up. To those who specialize in urology and to general surgeons alike this volume will appeal. It is in almost every respect a complete treatise. The only deficiency we have found is that operative urology is kept too strictly in the background: the author apparently aims at elaboration of pathology and symptomatology. The volume is divided into the usual sections—a general part concerned with the examination of the patient, the anatomy and physiology of the genito-urinary organs, the methods of physical examination, and the various forms of urinary analysis; and a special part, which is the greater moiety, dealing with the diseases of the constituent parts of the tract. The teaching is uniformly sound, and conforms to that generally accepted. Prostatectomy is recommended almost entirely on English and American lines—the Freyer operation for the suprapubic route, the Young operation for the perineal route. The chapter on kidney and ureter is, perhaps, one of the best; it is concisely written, yet is complete and full enough for any surgeon who wishes to extend his knowledge beyond the everyday textbooks. The author appears to have less difficulty than most in placing papilloma of the bladder, though he recognizes that differential diagnosis of papilloma and cancer is far from easy. A tumour, so far as its tufts or papillary growth are concerned, may be innocent, but malignant in its deeper layers and in its base. He believes it to be good practice to regard these tufted or papillomatous growths as simple.

[4] *Lehrbuch der Urologie, mit einschluss der Männlichen Sexualkrankungen.* Von Dr. Leopold Casper, Universitätsprofessor in Berlin. Zweite, neubearbeitete und vermehrte Auflage. Berlin: Urban and Schwarzenberg. 1910. (Sup. roy. 8vo, pp. 575; 221 figures. Mk. 15.)

Both kinds of tumour may be multiple or single. The innocent papilloma is the most common. The severity of haemorrhage is no indication of the kind of tumour; severe haemorrhage may occur from a papilloma, while a carcinoma may hardly bleed at all. One point of importance is that persistent bleeding with at most occasionally a few days' freedom always indicates malignancy; it may be an innocent tumour which has become malignant.

The book is well illustrated, mostly by drawings. The index is faulty because it is much too scanty.

We cannot say that we have felt much satisfaction in the perusal of Dr. BRANSFORD LEWIS'S translation, published under the title *Genito-urinary Diagnosis and Therapy*,[5] of PORTNER'S book on the subject. In the first place, there is far too little diagnosis and too much therapy. In the discussion of such a difficult diagnostic subject as renal tuberculosis, for example, we are referred simply to the paragraph on tuberculosis of the bladder, and there we find the whole subject dismissed in seven lines with the crux of the matter in these words: "As soon as the possibility of genito-urinary tuberculosis is thought of, the diagnosis is easy, and demands only the demonstration of the bacillus." We entirely disagree that the diagnosis is easy as soon as such a possibility is thought of. There are no recommendations to investigate the appearances of the ureteral orifices or balance the probabilities of the kind of renal infection nor indications how soon an early nephrectomy may be confidently advised. In a similar fashion diseases of the prostate are dealt with. There is no adequate discussion on diagnosis of prostatic enlargement, its varieties and forms, and no adequate description of the operation of prostatectomy; the author makes the unsatisfactory statement that "the prostate is approached by the abdominal or by the perineal route, and the gland is completely removed." The operation is recommended only after failure of conservative treatment, but the reader gets no help in deciding precisely when that form of treatment has failed. Indications for operation are quoted from Israel; these will meet with general approval, though to us they appear to postpone the operation unduly. The operation will be more likely to succeed when less severe stages or conditions are classed amongst the indications. The mortality is placed at from 4 to 7 per cent. We question quite seriously whether such a low mortality can, as a rule, be attained in everyday hospital and private practice. The section of the book dealing with papillomata of the bladder is good and the treatment is reasonably discussed. In the symptomatic treatment of this disease "all indications," it is said, "are met by one and the same medicament—silver nitrate." The bladder is irrigated two or three times a week with 200 c.cm. of a 1 in 1,000 solution of silver nitrate. In the short discussion on diagnosis no mention is made of microscopic search of the urine for broken off pieces of papilloma. The author recommends early diagnosis, and holds that cystoscopic examination is essential on the first appearance of haematuria. One of the chief features of this book is the enormous number of prescriptions—quite a satisfactory sort of thing for young practitioners anxious for variety. The translator has assumed also the office of editor. So far as we have been able to see, he has not so much exalted his office as employed it for the interpolation of his own ideas and inventions. One instance of this will suffice. The operation of circumcision (one of the simplest and most ordinary in the whole of surgery) devised by the translator is described in detail with no fewer than six illustrations.

COLLOQUIAL PHYSIOGNOMY.

DR. W. T. FERNIE has long been known to many of us as a genial and industrious compiler of books wherein old-world customs and superstitions—therapeutic, dietetic, and what not—are in pleasantly loquacious fashion strung together by a thread of shrewd commentary, adorned at frequent intervals by quotations from the poets and prose writers. In this, the latest (which, we regret to learn, is also to be the last) product of his pen,[6] Dr. Fernie discourses with undiminished charm and vivacity upon *Our Outsides and What They Betoken*—that is to say, upon things in general and physiognomy in particular; for the author is of the school of Burton, and no unworthy disciple of that immortal gossip. He rambles on from page to page and from topic to topic; and, whether he is discussing the colour of eyes, the contour of chins, the shape of noses, the expression of lips, the folklore of dwarfs, or the disposition of adipose tissue, is never for a moment at a loss for anecdotes or "learned instances." Consequently his books, and this book not less than its predecessors, are adapted not so much for continuous perusal as for picking up at odd moments in order to while away an hour in random turning of the pages. Such readings will reveal Dr. Fernie as a man very decidedly and very wisely "on the side of the angels"—that is to say, he knows how, in order to make a book on physiognomy readable, one must lean strongly to the affirmative side, to the side of belief and acceptance. Here, accordingly, without being troubled with sceptical cavillings, one may refresh one's memory with regard to the features and characteristics of the four main temperaments—the nervous, the sanguine, the lymphatic, and the bilious—collated by transcendentalists with the four "elements"—air, fire, water, and earth. Here one may read of the ill luck which dogged Victorien Sardou for five years after his accidental meeting with Jacques Offenbach, "a singular-looking old man with a hooked nose and reddish beard," believed to be a possessor of the "Evil Eye." Here, in the section devoted to phrenology, we may compare the cranial developments of Nero, Caesar, and Alexander; note the fullness of eyebrow typical of the artist, as exemplified by the heads of Michael Angelo, Titian, and Raphael; or the acute sense of form signified by the wide separation of Hogarth's eyes. Such things, whether we accept or reject them, make interesting reading. Dr. Fernie is far too modest to claim for his book the rank of a serious contribution to science. It appeals not less to the lay than the medical reader. It makes for entertainment. Above all, it appeals to feminine curiosity; and his publishers might find it a sound investment to advertise *Our Outsides* in the journals which cater for our better halves.

NOTES ON BOOKS.

VOLUME XXVI of *Merck's Annual Report*,[7] dealing with the year 1912, consists, like previous volumes, principally of a general summary of the original work bearing on therapeutics published in medical and other journals during the year. In the present issue a special article of fifty pages is devoted to lecithin, its occurrence, chemistry, mode of action, and therapeutic uses; a bibliography of lecithin literature which accompanies it contains references to the publications of over 400 authors and a much larger number of papers, most of these having appeared during the last ten or twelve years. This useful article is well-timed, in view of the importance which is now attached to the part played by lecithin in the body, both in health and disease. Following the article on lecithin, about 400 pages are devoted to various preparations and drugs, both natural and synthetic, the observations published during the year in regard to each being summarized. Indexes of drugs, authors, and diseases increase the usefulness of the compilation. Mr. E. Merck (66, Crutched Friars, London, E.C.), who publishes the work, informs us that a limited number of copies will be sent to members of the medical profession on application.

The second volume of MOLINARI'S *General and Industrial Chemistry*,[8] which deals with organic compounds, is distinguished by the same general characters as the previous volume on inorganic chemistry; in addition to the usual

[5] *Genito-urinary Diagnosis and Therapy; for Urologists and General Practitioners.* By Dr. Ernst Portner, Specialist for Urology, Berlin. Translated and edited by Bransford Lewis, M.D., B.Sc., Professor of Genito-urinary Surgery, Medical Department of St. Louis University. London: Henry Kimpton; Glasgow: A. Stenhouse. 1913. (Med. 8vo, pp. 221; figures 43. 10s. 6d. net.)

[6] *Our Outsides and What They Betoken.* By W. T. Fernie, M.D. Bristol: John Wright and Sons. London: Simpkin, Marshall. 1913. (Cr. 8vo, pp. 428. 4s. 6d.)

[7] *E. Merck's Annual Report of Recent Advances in Pharmaceutical Chemistry and Therapeutics. 1912.* Volume xxvi. E. Merck, Chemical Works, Darmstadt. 1913. (Demy 8vo, pp. 543. 1s. 6d.)

[8] *Treatise on General and Industrial Organic Chemistry.* By Dr. Ettore Molinari. Translated from the second enlarged and revised Italian edition by Thomas H. Pope, B.Sc., A.C.G.I., F.I.C. Vol. ii, Organic. London: J. and A. Churchill. 1913. (Roy. 8vo, pp. 790; 506 illustrations. 24s. net.)

systematic study of organic compounds, much attention is devoted to industrial processes for the production of the most important substances, and statistics of production and price in different countries are given at some length. The author states that his intention has not been to prepare a complete treatise on technological chemistry, and still less on chemical technology, but to present such a general treatment of the matter as shall be of value to the student who may later on be required to advise on or direct the processes of actual manufacture. It is not claimed that the processes described are in every case those actually in use in the most modern factories, familiarity with all of which would require a width of experience scarcely obtainable by any one man; and it is stated in the preface that "in any particular industry it has often been found that the results of investigations are in such disaccord with the practical data as to render it a matter of great uncertainty what conclusions should be presented to the reader." In spite of such difficulties and limitations, a mass of information is given which will be of great service to those requiring a knowledge of industrial organic chemistry, and at the same time an additional interest is imparted to the subject by the statistics. Among the matters dealt with at considerable length, petroleum, soaps, sugar, alcohol, explosives, and dyes may be mentioned; alkaloids receive somewhat meagre treatment. The English edition, translated from the second Italian edition, contains certain additional matter, particularly in the statistical data referring to Great Britain and the United States. The English is occasionally somewhat involved, and a few errors which are to be noted may perhaps be due to a too literal translation of the original wording—as, for example, the curious statement (italics ours) that chloroform "may cause death if not used with great care, since it acts on the heart; to diminish this effect it is *mixed with* atropine or morphine." The text is accompanied by fairly numerous illustrations of special apparatus and machinery.

The medico-chirurgical treatise on diseases of the stomach and oesophagus,[9] written by MM. A. MATHIEU, L. SENCERT, TH. TUFFIER, with the assistance of J. CH. ROUX, J. L. ROUX-BERGER, and F. MOUTIER, is an example of a book dealing with a subject which in practice demands the co-operation of both types of practitioner, and written by physicians and surgeons working in collaboration. It is almost needless to say that it is well written, admirably arranged, and abundantly illustrated with excellent drawings. The only defect we notice is the absence of an index. The outstanding feature of the book is the remarkable monograph on diseases of the oesophagus, written by M. Sencert with the assistance of Dr. Mathieu. M. Sencert is a surgeon; the merits of the contribution which extends to over 300 pages will be best appreciated by his surgical colleagues, and we strongly recommend it to their careful consideration. It contains a number of anatomical drawings, original and otherwise, and numerous illustrations explanatory of the surgical procedures mentioned in the text. Throughout the book the surgical position is dominant, but this is not surprising in view of the far greater progress recently been made in the surgical than in the medical treatment of stomach diseases.

The fourth edition of THOMPSON'S *Compendium of the Pharmacopoeias and Formularies (Official and Unofficial) with Practical Aids to Prescribing and Dispensing*[10] has been issued. Its scope and purpose are sufficiently indicated by the title. It is a strictly practical work. A list of recent unofficial remedies is first given; this is followed by a set of useful formulae; then comes an index of diseases and remedies, and lists of synonyms and incompatibles, notes on analysis of urine, bacteriological memorandums and notes on a number of other subjects as to which the practitioner may require information. Finally synopses are given of national pharmacopoeias, including those of the United States, France, and Germany. The book concludes with a full index in which the doses are set out; it will be found a convenient companion for the consulting-room table.

Mr. E. A. GARDINER, the senior science master at Berkhamsted school, has written a first year course in general science[11]—a combined textbook and notebook. This, he says, is an attempt to save time (but not work) for the boy and labour for the teacher. Nothing is told the boy which he can reasonably be expected to discover for himself, and additional questions and exercises are given as a safeguard against the work becoming merely mechanical. Part I consists of simple measurements of volume and mass density, specific gravity, pressure in a liquid, the principle of Archimedes, density of liquid, and solid flotation. Part II concerns some common apparatus and instruments—the Bunsen burner, construction of a wash-bottle, the thermometer, its construction and graduation. Part III deals with properties of water and air—purification of sea water by filtration and distillation, evaporation, solution, precipitation; the physical and chemical changes in water—boiling point, latent heat, evaporation, ice and its melting point, latent heat effusion, action of electric current on water, etc.; the familiar properties of air, solubility in water, weight and pressure, the barometer, oxygen and oxides, carbon dioxide, breathing of plants and animals, water vapour in the air, dew point. The author has put together an interesting and instructive laboratory course; the boys who carry it through and fill in the notes and tables, and answer the questions set, ought to receive an excellent introduction to science. In his preface he says: "No apology is offered for the lengthy lesson on manipulation of glass tubing; the number of boys one comes across, even in a sixth form, who will bend a delivery tube in an ordinary Bunsen flame is sufficient proof of the need of such teaching, and the sooner they are taught it the better for them and for the laboratory expenses." Things are moving onwards even in the scholastic world; when the writer of this notice was at school, no sixth-form boy attempted to bend a glass tubing or knew what a Bunsen burner was.

[9] *Traité médico-chirurgical des maladies de l'estomac et de l'oesophage.* Par MM. A. Mathieu, L. Sencert, et Th. Tuffier, avec la collaboration de MM. J. Ch. Roux, J. L. Roux-Berger, et F. Moutier. Paris: Masson et Cie. 1913. (Roy. 8vo, pp. 934. Fr.20.)

[10] *Compendium of the Pharmacopoeias and Formularies (Official and Unofficial), with Practical Aids to Prescribing and Dispensing.* By C. J. S. Thompson. Fourth edition. London: J. Bale, Sons, and Danielsson, Ltd. 1913. (Pott 8vo, pp. 366. 5s. net.)

[11] *First Year Course in General Science.* By E. A. Gardiner. London: W. Heinemann. 1913. (Cr. 4to, pp. 119. 2s. 6d. net.)

MEDICAL AND SURGICAL APPLIANCES.

Tonsil Enucleator.

MR. HOWARD WARNER, M.B., B.S.Lond. (Fakenham, Norfolk), has designed an enucleator for use in the complete removal of tonsils of the following types: (*a*) The ordinary enlarged tonsil, over the anterior surface of which the anterior pillar of the fauces is spread and firmly adherent. (*b*) The small, fibrous, embedded tonsil, the subject of repeated attacks of follicular inflammation, which cannot be properly introduced into the guillotine. In using the enucleator the tonsil is grasped with fixation forceps and pulled gently inwards and the mucous membrane is divided with the extreme tip of the enucleator (which is the only part approaching to sharpness) between

the anterior pillar and the tonsil. The curve of the blade enables the operator to separate the body of the tonsil completely from its bed working from above downwards, and finally the lower pole, which is hanging only by mucous membrane, may be separated. The enucleator is double-ended, thus being suitable for either tonsil, and is curved slightly on the flat; this does not show in the illustration. The blades are quite blunt, except the extreme tips, which are half-sharpened only. The instrument was made by the Holborn Surgical Instrument Company.

MEDICINAL AND DIETETIC PREPARATIONS.

Sour Milk.

WE have received from the makers, the Société du Yaourt d'Orient (Paris; and 10, Hans Road, Brompton Road, London, S.W.), a sample of the sour milk which they prepare and market under the name "Yaourt Ariston Sour Milk"; it is stated that this is made by a process of which the secret is known only to a few, whether in the East, where it originates, or in the West. Our examination of the sample showed that it was of about the consistence of junket, and had an agreeable taste, quite free from bitterness; on titration it was found to contain 1.3 per cent. of lactic acid, and microscopical examination showed the presence of the characteristic bacilli in an active condition.

Nova et Vetera.

PROVERBS ON ARTICLES OF FOOD: AN ADDENDUM.

By Sir John Byers M.A., M.D.

The following proverbs and sayings—almost all of which I have heard myself in the north of Ireland—are in most cases expressed in the dialect or language spoken by the people themselves, and especially by those living in the country districts. They may form a slight addition to those recorded in the extremely interesting paper on "Proverbial Medicine," in the British Medical Journal of September 27th, 1913, which dealt with proverbs on such articles of food as butter, eggs, and tea.

1. *Butter.*

A common proverb heard in Ulster is "Butter to butter is no kitchen." It would be quoted if two eligible young girls were seen walking or dancing together, and it is also sometimes applied to a tiresome reiteration of anything. "Kitchen," in the dialect of Ulster, means anything eaten to give a relish to some simple articles of food. Thus butter, bacon, or herrings improve such plain fare as bread or potatoes; they give them the necessary relish or condiment which is styled "kitchen," and if a housewife had nothing with which she can "kitchen" a dinner the meal would be a poor one. I recollect at a consultation in a country district, the farmer's wife at whose house I met the doctor of the locality asked us before leaving to have some "potatoes and kitchen," which latter took the form of an excellently cooked duck. In the case of the young women dancing or walking together, the "no kitchen" is the absence of companions of the other sex. "Kitchen" is also used in another sense, meaning to serve out sparingly. I remember, at a meal which followed a funeral in the country, hearing some one say to a stranger who had been asked to carve at one end of the table, "Kitchen that turkey, for there are a good many to go roun'."

A man's laziness surely reaches its maximum limit when it is remarked about him, "He's as lazy as butter's grazy" (greasy). Of a cook who wasted the butter it will be said, in a punning way, "She's the grub that makes the butter fly," while a flatterer can "lay on the butter," or can "butter you up." A man who was complimented on his great success in life said, "I didn't get it all for atin' (eating) butter." What he wished to convey was that his prosperity depended not in doing simple things (such as eating butter), but rather by dint of hard work. A knife is pretty useless when "it's that blunt that it would not cut butter"; and when something which was attempted carefully to be concealed leaks out or comes to the surface, it will be remarked "The butter's comin' out of the porridge now," the reference being to the custom of covering well up in porridge a piece of butter which appears in time as the food is eaten. A man who it is noticed pays special attention to, or humours in every way, some friend or relative who has a great deal of influence or wealth, will bring upon himself the remark, "He knows on what side his bread's buttered"; while just as some fortunate people are "born with a silver spoon," so others seem always to have their "bread buttered on both sides." The proverb, "Butter goes mad twice in one year," clearly means that in summer it is too soft, and in winter too hard and also too expensive. "He'll not go to market and cry dirty butter of his own" is said of a man who knows how to get rid of his wares to the best advantage, like the woman who "never sells her hens on a rainy day." It is certainly not very complimentary to say of any one, "She spreads the butter on the bread as thin as the striffin of an egg"—that is, the thin film inside an egg shell. "It takes no butter off your bread," said to any one means that the person's interests are not affected.

Sometimes butter is depreciated in value owing to its appearance, either because it has been imperfectly worked after the salt has been added to it, or because in the process of churning the water that is added has been too hot. As a result, "lump butter," which is prepared for market in the form of brick-shaped masses called miscans (Irish *mioscân*, a small dish or lump of butter), when cut presents a series of streaks formed by a quantity of small holes: it is then said, from its resemblance to a row of pins, to be "pinrowed." Again, butter may be much diminished in value as an article of food when it has a rancid unpleasant flavour, "a tack" (tack is derived from the old French word *teche* of the eleventh century, and *tache* of the twelfth century, which meant a spot or blemish). The word is preserved, and appears in modern French medical scientific literature in the term *tache cérébrale*. When butter after use leaves a disagreeable, penetrating, so-called "after" flavour, or taste which conveys the impression that it has come in contact with something else, it is said to have a "*twang*" or "*tang*"—a fine old Norse word which has been known in English literature from the fourteenth century. It is also applied to an odour, as "the tang of turf-smoke." A much simpler expression, used to describe an unpleasant taste in butter, is often conveyed by the saying, "that butter's touched," exactly the same term as is applied to one who exhibits some mental defect.

2. *Eggs.*

Any one who is "not worth a fresh hen-egg" is in a poor way physically or financially, and the saying "It's a poor hen that can't scrape for two chickens"—when applied figuratively to a mother who is bemoaning her fate with two children—is very significant. How apt is the saying used in reference to a boastful, fussy person, "It's not the hen that cackles most lays the biggest egg"; while how better can a very restless creature be described than to say of him "He's like a hen on a hot griddle"? When a man who has been carrying a sack or any heavy burden on his back arrives at his destination and cleverly deposits it on the ground he will remark—or some one else may do it for him—"'Well laid,' as the hen said" (another punning proverb). "They cackled before they laid" is reported of people whose performance is far short of their boastful promises. When any one talks too much about a matter which should be kept quiet it will be said, "If yer too keen in the clocken ye'll discover the eggs" (the use of "discover" meaning to tell or disclose is a very old one). "There's a rayson (reason) in roastin' eggs," means, when said to any one, that you should not find fault with a line of action about which you do not know the real reason for it. "He must be gettin' better, for the doctor *put him on an egg*," means the doctor improved the patient's diet. I heard a man quote to a "ne'er do well" who had gone all over the world and returned unsuccessful, "A rolling stone gathers no moss"; to which the reply came at once, "A sittin' hen never grows fat." When something that it was hoped would be a great success totally fails it will be said of it, "That's a saft (soft) egg," while an unreliable person without character is often called a "saft egg." When dealing with a very greedy and avaricious man you will be advised to be careful for fear "He'll give you the shell while he keeps the egg" (a variant is "He'll keep the potato and give you the skins"). In Ulster there are a number of proverbs in which an additional clause to the form usually quoted is a great explanatory improvement. Here are two proverbs in reference to eggs: "Don't count your chickens before they are clocked (hatched), for fear some of them might be ducks," and "You spoke a while late, as the man said when he swallowed a bad egg and heard the cheep of the chicken as it went down his throat," which I heard used in this way: Two men were settling a dispute between some parties, and on making public their decision one of those affected began to object, when the proverb I have quoted was given as a reason for not reopening the arbitration.

Of an undulating type of country it will be said, "It's up and down like a baskit of eggs." I have heard this specially applied to County Down, which is often called the "Yorkshire" of Ireland. In relation to the egg as the emblem of heredity there is a proverb, "A black hen may have a white egg," which I heard quoted recently against the eugenists, as it indicates figuratively that children with good qualities may be born of parents not so gifted.

3. *Tea.*

That tea should not be stewed is made clear by the proverb, "The first of the tay-pot, but the last of the cow," of which, "The fore-part of the tay and the strippins (or stribbins) of the cow," or "The hind-milk of

the cow and the fore-milk of the tay-pot" are slight variants. In other words, the richest of the milk yielded by the cow is the last which is "stripped" from the udder, while the tea which is first taken from the tea-pot—after a proper time has been left for its infusion—being without the deleterious substances apt to develop in tea which has been kept too long, is the best. A variant is, "The finest of the meal and the coarsest of the potatoes." A "tea and turn-out" entertainment means that those present should understand that no other meal will follow; while "a long sleep and a tay breakfast," is a saying used by workers to describe Sunday.

Many years ago cocoa of an inferior coarse type was sometimes used in Ulster, and was called "miserable"; and, as an indication at an early period how exclusive an article of diet tea was, owing to its price, there arose the couplet:

> The wives of the officers sat down to tay,
> The wives of the soldiers took skillabolay.

(Skilly, skillagolie, or skillabolee, was a sort of thin oatmeal porridge or poor weak gruel, used by soldiers, and also by occupants of gaols and workhouses.)

A match-maker, in recommending a suitor to an eligible lady may "butter him up" as one who has a nice "wee nest-egg," but she will certainly not forget to add to the lady—provided the facts warrant her—that "there will be no one between you and the tay-canister," that is, the bride-to-be will be the only female monarch in the projected new home.

NATIONAL GAS CONGRESS AND EXHIBITION.

A Conference on Smoke Abatement.

The National Gas Congress and Exhibition in London is doing service by bringing into conference hygienists, sociologists, and others, who are interested only incidentally in the gas industry. Smoke abatement was the subject discussed at one of these gatherings, held on October 9th, and although the claims of the gas fire as the most obvious practicable means of lessening the smoke nuisance were fully and ably put forward, they were not suffered to obscure the large issues of the problem.

The chair was taken by Sir William H. Bennett, F.R.C.S., who pointed out that it was only when the basis of comparison between coal and gas was restricted to their respective prices, and to the number of heat units generated by each, that coal appeared to be four or five times cheaper than the rival fuel. When account was taken of the enormous waste of heat energy in connexion with coal, not to mention the damage to interiors as a result of the coal fire, the relative expensiveness of gas disappeared. Not only was the gas fire as efficient as the coal, but if properly installed it was equally sanitary. A proper installation, however, would include a chimney or fire shaft, otherwise gas was a menace to health. No form of heating was really suitable for domestic purposes which did not provide automatic ventilation. On the general question of smoke and fog, Sir William Bennett's paper was as trenchant, if not as picturesque, as one which came later from Sir William Richmond. The dense ground-fog and the sun-screen, or overhead fog, said Sir William Bennett, affected health in different ways, but both were a public menace. Although the troubles caused by fog were chiefly respiratory, almost any organic disease was liable to be stimulated, partly by the direct effect of the fog itself, but more especially as a result of the lowered resistance due to the coldness of the air in the fog area. This latter factor was a danger to health which had not received the attention it deserved. Another frequently unsuspected result of fog was its deleterious action upon milk. There was no doubt that milk coming from cows which were kept within the fog areas of large towns was deficient in lime, owing to the sulphuric acid deposits upon the pasture. Yet another count in the indictment against coal smoke appeared to be shaping itself out of the recent investigations into the relation between fuel and cancer. A comparison between certain peat-burning and coal-burning areas in Scotland had gone far to establish a connexion between the incidence of cancer and the sulphur content of the fuel used. Cancer was shown to be most marked in districts where coal was the staple fuel, or where the variety of peat burned had a high sulphur content.

Dealing with this point in the subsequent discussion, Mr. F. W. Goodenough drew attention to the fact that only an infinitesimal proportion of the total amount of sulphur in the coal was conveyed in the coal gas offered as fuel. This was confirmed by another speaker, Professor Vivian B. Lewes, Chief Superintending Gas Examiner to the City of London, who had compared samples of dust taken from places in which there were coal fires but no gas, either as illuminant or fuel, with others from places in which only gas was used for both purposes. The relative scarcity of sulphur in the dust from gas-heated and gas-lighted buildings was an important fact. Professor Lewes also read a paper, in which he pointed out that the chief damage done by smoke was not the result of the soot or solid carbonaceous matter, which settled readily from the air and was washed down quickly by rain, but of the tar vapour. It was the cloud of floating vesicles of tar, containing flue gases and vapours, which glued the dirt to our buildings, stopped the pores of animal and plant life, and caused the familiar yellow fog. The obvious method of abatement was the more general use of gas stoves, and Professor Lewes produced a balance sheet, showing that, of the total amount of heat generated in the case of a gas fire, 62 per cent. was utilized, 50 per cent. being radiant and 12 per cent. convected heat, whereas in the case of the coal fire the percentage utilized was only 19. The chief losses were due to the escape of heat in the flue gas, to unburnt gases and vapours, to decomposition and volatilization, and to the heat remaining in ashes and grate. With a gas fire the wastage from all save the first of these causes was eliminated. Professor Lewes was not oversanguine as to the future wholesale displacement of the coal grate by the gas fire, for the reason that the limits of economical gas production were rapidly being approached, and that the absence of a market for the increasing quantities of coke would constitute a difficulty.

Subsequently Sir William Richmond sounded a vigorous call to action, in which he suggested that a tax should be put on smoke; and in another breezy paper Dr. H. A. des Voeux outlined the history of the Coal Smoke Abatement Society, and described the war which for the last fourteen years has been waged upon the coal fire in its "entrenched position, behind iron bars, and protected by shovels, tongs, and pokers, as well as by every maiden aunt in England"—an obstacle before which "a Wellington, a Marlborough, or even a Sir Almroth Wright might have wavered"—but the million gas stoves now in use showed among other things that the crusade had not been in vain.

School Lighting.

The lighting of schools was the subject of another interesting conference, which took place on October 11th under the presidency of Sir George Kekewich. The opening paper was read by Professor Silvanus Thompson, who brought forward certain considerations on the brightness of lights. One of his suggestions was that the Board of Education should issue an order prohibiting the use of shiny paper, having the so-called art surface, in schools. Very smooth paper acted partly as a mirror, and reflected too much light at particular angles. Another suggestion was that every school inspector should be equipped with a simple photometer, so as to be enabled to measure directly the illumination received at any surface, and to decide whether the desks and walls, and especially the blackboard, were adequately illuminated. A system of indirect lighting in which the rays of lamps were intercepted and thrown only upon ceilings and walls, so that a soft, diffused light reached the eye, had advantages for writing and reading, but the shadowless illumination interfered with the visibility of solid objects and raised surfaces, such as textile fibres. For diffusing purposes Professor Thompson pointed out that while opal globes and ground-glass shades, to say nothing of devices of paper and silk, were useful as means of preventing the illuminating source from injuring the eye, they wasted an unconscionable percentage of the light. Modern dioptric globes were far less wasteful; they spread the visible outline of the source, but with a minimum loss by absorption.

Mr. Leon Gaster gave a summary of the preliminary report on school lighting recently prepared for the Illuminating Engineering Society by a special committee. The

main recommendation was that for ordinary work, such as reading and writing, the minimum illumination at any desk should not be less than 2 (or, according to some members of the committee, 2½)-candle feet, and that for special work, such as drawing and stitching (preferably always done by daylight), the illumination should never be less than 4-candle feet; while for blackboard illumination a standard of 2-candle feet was admitted to be sufficient only for small class-rooms where the students were within 20 feet of the board.

A model class-room scientifically illuminated is one of the features of the Gas Exhibition. The chief point of interest is the illumination of the blackboard by a source of light immediately in front of and above it. This is backed by a shield of dark metal, so that the light-source is invisible to the class. The standard illumination is also secured on each desk without allowing the rays of light to fall injuriously on the eyes, either of teacher or scholars.

THE NEW GERMAN INSURANCE ACT.

[From our Special Correspondent in Berlin.]

The alterations and amendments which are to supplement the original Act, and which come into force on January 1st, 1914, are of the utmost importance to the medical profession in Germany. It would seem that, as has been the case from the incipience of the national insurance scheme, the Legislature has once more turned a deaf ear to the claims and suggestions put forward on behalf of the profession.

The old division into three main classes of insurance—(1) accidents, (2) sickness, (3) invalidism and old age pensions—is still to obtain, but it is supplemented by a fourth class, that which pertains to provision for widows and children of insured persons.

The original term, the "Workman's Insurance Act," is now no longer applicable to the scheme, for the new regulations embrace circles far removed from those of the labouring classes, and invade deeply the middle strata of society. The income limit of those compelled to insure has hitherto been £100 per annum; it is now to be raised to £125, and will in future include all workmen, all domestic servants, and all who contract to work for employers of labour, at home or in their own workshops, even when their income exceeds the £125 limit, provided that it does not exceed £250 per annum.

Furthermore, there are to be included all artificers and technical workers, school teachers, tutors, etc, minor works officials,[1] and shop assistants, those connected in any capacity with the stage, concert hall, or opera, provided their income does not exceed £125 per annum. In the event of an increase of income among the aforesaid the law still allows them to remain "voluntary" subscribers under the Act until officially informed that their income has exceeded £200. All independent workers and small landowners whose income does not exceed £150 are included as voluntary members.

The scheme, which comes into force next year, will cover not only the labouring classes, but a very large percentage of the official and middle classes. Compulsory insurance, which applied to 13 millions of the population under the old system, is now to be enforced on 22 millions, and to that colossal figure is still to be added the unknown numbers of those who may voluntarily insure, so that in some districts it is computed that not less than 92 to 95 per cent. of the total population will be insured.

It is not too much to say, therefore, that the new regulations will have a most far-reaching and vital effect on the economic position of the profession, particularly on its younger members, whose income is mainly derived from middle-class patients; and it is not surprising to hear that most bitter disputes are to be expected between the doctors on the one hand and the authorities entrusted with the administration of the State mandate on the other. These bodies correspond to the English sick clubs and friendly societies, etc., and they are to undergo a very complete reorganization in the new year. Their number is to be very considerably reduced, and they will be divided into, or rather amalgamated under, two groups:

1. The Urban Insurance Society (*Ortskrankenkasse*).
2. The Rural Insurance Society (*Landeskrankenkasse*).

The first category includes skilled workmen and officialdom in general, and the second farm labourers, home workers, and domestic servants. The various small societies which at present administer the Act in Berlin are all to be dissolved, and will then be amalgamated into one gigantic organization with a membership of between 400,000 and 500,000.

The question of choice of medical attendant has been repeatedly raised, and is a very real problem. The societies have hitherto been free to choose between one of two systems. According to the first any medical man has the right to apply for the inscription of his name on the society's books, and the member has the right to choose his doctor from among the registered names, according to his personal wishes. Under the alternative system the society reserves to itself the right to appoint a prescribed number of physicians to work for its members who can select their medical adviser only from this particular panel. The medical profession has always been strongly in favour of free choice of doctor, whereas the majority of the societies are in favour of the fixed panel system, arguing that such an arrangement is more economical, whereas the true reason is to be found in the fact that they are thereby in a better position to control the medical man. The new regulations do not favour either disputant, and allow both systems to remain. It is probable, however, that the imminent reorganization of the committees of management will considerably curtail the present powers of the administrative bodies, and that the sad, but common spectacle—in Berlin especially—of medical practitioners obtaining their insurance appointments by personal canvass and other undignified means will now become a rarity. It is more than probable that in the near future the controlling Boards will be composed of equal numbers of lay and medical members, in whom will be vested the power to appoint or reject medical men who apply to work under the Act.

It is a fact that the majority of medical men at present employed by the various smaller organizations which are to become amalgamated on January 1st will lose that part of their income derived from this source, and it is, therefore, not too much to demand of the Legislature that due and ample consideration be shown them when, consolidation of these societies being effected, further supplies of medical officers will be required.

In spite of the most urgent representations by the medical profession, there is no indication of any increase in the capitation fee of 5s. a patient per annum, and it is significant that the President of the Government Insurance Offices, whose permanent function it is to arbitrate between the societies and the profession, in a letter to the medical representative, has characterized this sum as "ample and proportionate."

Such are the main points of dispute between the doctors and the insurance societies, and at one time it appeared that their differences were irreconcilable. But an agreement may shortly be arrived at, and the final signatures may, indeed, be appended to it any day. It is greatly to be hoped that, in spite of the lateness of the hour, the medical leaders will yet succeed in still further mitigating the damage threatened by these alterations in the law to the status and dignity of the whole profession.

[1] The word used is *Betriebsbeamten*. It implies a person discharging duties similar to those of a foreman in England, but the majority have had some theoretical education.

MOTOR CARS FOR MEDICAL MEN.

Light Cars.

Dr. Wm. J. Furlong (Dublin) writes, in reply to "Motor Cyclist": I have been running one, a two-seater Ford car, for eighteen months—week days, Sundays, and occasionally at night—without any trouble. The same set of tyres, Dunlop's grooved, are on since I bought the car, having done 5,680 miles up to the present, only requiring a few cuts filled in. I use 1 gallon of petrol to 15 miles; but constant stopping in town work is wasteful, and it would work out much better in country work. The car has given every satisfaction. It generally starts at once on second push of handle, except the first thing in the morning, when it requires some extra winding to begin with. It will climb 1 in 12 at 20 miles an hour with two up.

British Medical Journal.

SATURDAY, OCTOBER 18th, 1913.

A NEW EXPERIMENTAL PSYCHOLOGY.

Professor Pawlow's address on the investigation of the higher nervous functions, printed upon another page, gives the results of something like a quarter of a century's work upon this most interesting and most obscure subject. Knowledge of the functions of different parts of the cerebrum is still very incomplete. Large areas of its surface have yielded so little to experiment that they are known as "silent areas"; of the actual working of its internal economy, the systematization of its fundamental mechanisms, we know almost nothing. Professor Pawlow contends that the problem of the functions of the cerebral hemispheres is really a problem for the experimental physiologist and no one else. Psychology, he says, has made little of it, for the science of psychology is still lacking in exactitude. One may add that the findings of pathology give information here that is often of great interest, but lacks the continuity and the possibility of being controlled that are essential for the study of such complicated matters. If any progress is to be made in the knowledge of the mental functions of the brain, it must be made, Professor Pawlow maintains, by the pure physiologist.

For the last twelve years he has devoted himself to the experimental study of reflex action and the prime function of the nervous system that concerns the formation of new reflexes. Evolution and the adaptability of living creatures to their surroundings demand that new reflexes should be capable of being formed, and this Professor Pawlow finds does occur. His method of experimentation is quite simple in principle. The animals upon which he works are dogs. The reflex action he studies is the secretion of saliva. The stimuli employed to provoke the reflex are various; food or a dilute acid solution are given by the mouth, both of them active excitors of salivary secretion, and at the same time various external stimuli—heat, electricity, pain—are applied. In the course of time the latter stimuli develop into infallible excitants of salivary secretion; what is more, they then cease to produce the reflex (fright, pain, or the like) to which they originally and naturally gave rise. In other words, the stimulus has been diverted from one region of the nervous system to another; and this power of adaptation must be regarded as one of the most important functions of the highest parts of the central nervous system. When the new reflex has been cultivated, if the skin of the dog is subjected to cutting or pinching or burning, the only result obtained is the manifestation of symptoms of the keenest appetite, and no evidence of fright or pain at all. Such a trained reflex Professor Pawlow calls a "conditional reflex," to distinguish it from ordinary reflexes and to indicate its great dependence on a multitude of conditions. It is established by specialized parts of the central nervous system, which Professor Pawlow terms "analysors," comprising the peripheral end organ of the so-called sense organ, the nerve fibre belonging to it, and its termination in the cells of the cerebral hemispheres. Such analysors are incessantly at work controlling the reactions of the living organism to its changing external conditions; probably many results we now ascribe to metaphysical processes are really only due to the fine and accurate work of such neural analytical mechanisms. Conditional reflexes are sensitive to all sorts of conditions and show a great variety of inhibitory phenomena; if the brain is removed they all disappear.

To what extent are different parts of the cerebrum involved in such reflexes as these? The question may be attacked in two ways: First, the cortical "spread" of the stimuli evoking a conditional reflex may be studied. Just as general epileptiform convulsions may be produced by exciting quite small points on the motor cortex, so may a number of reflexes, conditional and otherwise, be excited by normal or artificially produced stimuli. Secondly, the results of ablation of parts of the brain may be investigated, and Professor Pawlow quotes several instances in which this has been done. The details need not be recounted, but seem to show that a well-developed conditional reflex has a definite cerebral localization, particularly in the frontal lobes of the brain. Curious light has been shed on the physiology of sleep and hypnosis by these and other experiments. Conditional reflexes built up by stimulation of the skin may be developed in certain conditions so that the reflex disappears, and the conditional stimuli produce not the reflex but a drowsy, or even cataleptic, condition passing into deep sleep. Professor Pawlow concludes that we now have experimental proof that the cerebrum is the organ for the analysis of sensations, and for the construction of new reflexes and new interpretations of sensations, and that his method of investigation will take us far in the analysis of the mental functions of the brain. Will it be found that our every thought and deed is a reflex, and man a mere automaton conditioned by his various reflex mechanisms and his environment? Do these experiments throw any light upon the successes that may result from faith-healing, or the methods of Christian Science, so called? Such questions he leaves untouched. He deplores the fact that psychology has never yet given him practical help in his work; its help consists solely in words, for it needs itself first to be analysed and explained. One may recall the very similar criticism of metaphysics made by the eminent physicist, von Helmholtz, who found that branch of philosophy so sterile in practical results.

Taken in its entirety, Professor Pawlow's method of investigating the higher functions of the brain is new, and has yielded results of the first importance. His work illustrates the truth of the thesis defended in his examination for the doctorate by the great German physiologist, Johannes Müller, ninety years ago, "Psychologus nemo nisi physiologus"—no one but the physiologist can advance psychology.

THE FORM OF THE STOMACH.

When Cannon, in 1898, initiated the study of the gastric and intestinal movements in dogs and cats by means of x rays, and more especially when, at a later date, the same method of examination was shown to be applicable to the human alimentary canal, a new field of clinical investigation was opened up whose limits as a means of diagnosis have not yet been reached.

By gradual improvement in the physical details of the x-ray apparatus the length of the exposure

necessary to obtain radiographs has been reduced from minutes to fractions of a second, and by using the screen the passage of a bismuth meal along the alimentary tract can be directly followed without the need of taking photographs. There are, in fact, few more interesting x-ray demonstrations than those obtained in watching the passage of the bismuth-laden food from the pharynx into the stomach, and onwards to the duodenum.

A method of examination so simple and yet so effective has naturally attracted much attention from many sides, for the results were widely different from anything that had previously been obtained. But while the mechanical difficulties in the examination have been largely overcome, it must be admitted that uncertainty exists as to the interpretation of the appearances obtained and as to the whole value of the method. Several causes have contributed to render difficult the interpretation of the screen pictures or radiographs. Even in healthy individuals amazing variations have been found in the apparent form and position of the stomach, not only among different persons, but also in the same person from time to time. One of the earliest results of the application of this method of examination was to confirm the impression, which had been gaining ground among anatomists since the use of formalin became general, that the current description of the stomach could no longer be considered to harmonize with all the appearances which were being found in bodies prepared by formalin injection, and that their conception of the anatomy and physiology of the stomach must be modified.

The work of W. His and of D. J. Cunningham upon the varying form of the stomach anticipated a good deal that has since been written. These observers showed, from the study of anatomical specimens only, how profoundly the shape and form of the stomach were modified by varying conditions, and during different phases of digestion. They recognized further that the aberrant forms of the stomach often met with represented different phases of gastric activity, and that different parts of the stomach had different mechanical as well as chemical functions. This work remained incomplete until further knowledge was obtained by watching the stomach by x rays, as well as by examining it at surgical operations, but in the main it has been corroborated by the further examination to which it has been submitted.

The whole subject was discussed fully by anatomists and Roentgenologists at the Liverpool meeting of the Association, and within the last few months a prolonged correspondence has appeared in the pages of this Journal upon the shape and form of the normal stomach, in which views of considerable diversity have been expressed. Dr. Barclay, who took part in this correspondence, has set forth in a volume published recently[1] his views upon the value of x-ray appearances as a guide in diagnosis and prognosis. It may at once be stated that Dr. Barclay has little additional light to throw upon the subject of the normal stomach. His description of it is short, and in a footnote it is stated that "the description is left purposely vague—it is as fruitless to apply the precision of descriptive anatomy to that organ as it would be to give exact figures and shapes for an india-rubber balloon." The main positive result which emerges is that the x-ray shadow of a bismuth meal in a normal stomach may present very wide variations and yet be within the normal.

But while it may be impossible to give anything but a vague description of a normal stomach, the vagueness arises from the fact that the normal stomach presents many different appearances in the different stages of digestion, and a much less vague description can be given of the normal empty and of the normal filling or filled stomach. It would have been of considerable assistance if Dr. Barclay had given a somewhat more detailed account of the sequence of events in a normal stomach.

The value of x-ray examination lies largely in the fact that the stomach does not behave as an "india-rubber bag," but has in its walls a sensitive mechanism—the contractile muscular coats. As Dr. Barclay says, it is in the examination of the functional activity of this coat that the greatest help in diagnosis is obtained. Pathological defects are to be judged largely by the tonic and peristaltic activity of the stomach, by the rate of emptying itself of a meal, and so on.

The question whether there is a physiological subdivision of the stomach into parts is of considerable interest. There is much evidence, derived not only from x-ray examinations but from other sources also, to show that there is such a physiological subdivision, which expresses itself structurally in phases of digestion, one portion, near the fundus, acting as a reservoir, not greatly affected by peristaltic waves, and another, the pyloric part, which is capable of contracting itself into a cylindrical tube, and is greatly affected by peristaltic waves.

In some other sections Dr. Barclay mentions, but does not discuss, questions of this kind, but his book will be useful as a guide to x-ray work on the upper alimentary tract, and shows the potentialities and limitations of the method. His statements, based upon the work which he himself has done, of the grounds upon which he is inclined to make a diagnosis of atony, of pyloric obstruction, of carcinoma of the stomach, and other diseases, are valuable; and, in summing up the question of the value of x-ray diagnosis, he states that the point has not yet been reached at which it is possible to say "there is no active pathological lesion of the stomach walls," but adds that evidence is accumulating which he believes will soon lead to the possibility of always making a definite positive diagnosis of pyloric ulcers. One suggestion made is that many gastric ulcers are due to spasmodic contraction of portions of the stomach wall set up by swallowed septic matter, constipation, mucous colitis, and a variety of other conditions capable of producing spasmodic contraction of portions of the stomach wall. This theory is modestly put forward, and seems to deserve consideration from other aspects than that of the x-ray worker.

[1] *The Stomach and Oesophagus.* By Alfred E. Barclay, M.A., M.D. London: Sherratt and Hughes. 1913. (Sup. roy. 8vo, pp. 126; 29 figures. 7s. 6d. net.)

THE ASYLUM SERVICE.

The somewhat desultory correspondence which has taken place recently in the Journal on the grievances and disabilities of assistant medical officers of asylums has sufficed to reveal a widespread unrest and discontent. The story told is not new; it has been repeated at irregular intervals for a good many years past, and until the causes of the grievances, which have a continuously unfavourable influence on the junior asylum service, are removed they will continue to find expression.

The grievances are numerous, but they all grow out of two defects in the asylum service. The one is that the prospects of promotion for an assistant medical

officer are few and uncertain, and the other that the conditions of the service are such as tend to curtail opportunities and occasions for clinical or scientific investigation, crush initiative, and turn the officer into an administrative drudge. There are conspicuous exceptions where a liberal-minded committee and a wise superintendent have combined to create opportunities for clinical investigation in the wards and in the laboratory of the asylum, but the statement made is true as a general proposition, and we shall have to go a very long way before we reach the position to which some other nations have already attained.

We have used the term "asylum medical service" for convenience, but it is not strictly speaking correct. There is in truth no such service, but only a number of local asylums each with its medical superintendent and assistant medical officers. Save in the case of some populous counties with several asylums there is no connexion between one asylum and another, no system of transfer of officers from a position of less to one of greater responsibility, no system of promotion by merit or even by length of service. We are far from advocating a system of promotion by seniority, but a man who has given good service and gained experience ought to be able to count on promotion, increased emoluments, and a wider scope for such talent as may be in him. As it is, he cannot count with any approach to certainty on anything better than plodding on with some trifling accession of income until he is worn out, or, taking his courage in both hands, leaves asylum work to find some other sphere of practice for which the years spent as a specialist in a subordinate position are not likely to have fitted him.

A remedy for this state of stagnation, which is not good for the man, for the asylum or its inmates, or for the progress of psychiatry in this country, must be found, and we are glad to learn that the Durham County Asylum Committee has taken the initiative, and has invited other asylum authorities to consider the advisability of calling a conference at an early date. The invitation has already been accepted by several asylum committees, and if such a conference were to meet it would doubtless find many other topics affecting asylum administration ripe for discussion. A petition to which a large number of signatures has been appended has, we understand, recently been presented to the Government, asking for the nationalization of asylums, as it is believed that such a change would do away with the inequalities in maintenance rates and in the incidence of taxation, and with disparities in the salaries of staffs, lay and professional. It would also render possible the establishment of a graded service for the whole country, and greatly facilitate the institution of an equitable system of promotion. There are doubtless other questions which such a conference would find it profitable to consider, but the programme outlined is sufficiently wide for several days' work, and there can be no doubt that it would conduce to the formation of a healthy public opinion with regard to the administration of asylums for the insane. It is essential to recognize that asylum authorities and the medical profession must take the public along with them if any far-reaching reforms are to be carried through. Improvement in the emoluments of assistant medical officers would doubtless do a good deal to produce contentment, but asylum committees are custodians of the public purse, and the justice and necessity of increased expenditure must be shown. That the claim for such increase is just is realized by those who are acquainted with present conditions, and that it has become necessary the increasing difficulty in finding young medical men willing to become assistant medical officers is evidence.

But increased salaries alone will not suffice to attract to the asylum service and retain in it the stamp of man the country needs and has a right to command for this work. He will be got if assured of freedom to live a normal life, with opportunities for making himself efficient in his speciality and of advancing our knowledge of it, and with a reasonable prospect of attaining a position of greater freedom and responsibility when he has proved himself worthy of promotion.

We do not think that any good will be done by further correspondence ringing the changes of grievances which have been sufficiently expressed and not disputed. It is to be hoped that the proposal for a conference put forward by Durham will be taken up, and it would be well that the assistant medical officers would agree in drawing up a case in which the disabilities under which they labour should be temperately stated and from which all special or local grievances should be excluded.

RECORDS OF PRACTICE UNDER THE INSURANCE ACT.

JUDGING from letters received in the central offices of the Association, there would seem to be reason to fear that a good many medical men who have joined panels under the Insurance Act are not fully alive to the importance, from more than one point of view, of keeping full and accurate records of all the work they do under the Insurance Act. These records will eventually pass into the hands of the Insurance Commissioners, and as by the agreements they have signed with the Insurance Committees medical men have undertaken to keep such records, the Commissioners may feel justified in assuming that the returns reaching them are complete; from the collation of these returns conclusions may be drawn which may have an important influence on the policy of the Government and on the interests of the profession in the future. Medical men notoriously dislike the book-keeping side of their profession, and few things tended to make the early days of the operation of the Insurance Act more unpopular with the members of the profession who accepted service than the way in which clerical duties were heaped upon them. It seemed to suggest that the attendance upon the patient was quite a secondary matter. There may have been a good excuse for any defaults in record keeping which occurred during the strenuous days of last January and February, but every practitioner on a panel should by this time have organized his clerical work, on a strictly business footing, and should now be in a position to note carefully every attendance—that is to say, not only visits paid and consultations at his surgery, but also every occasion on which a patient has been seen for the purpose of obtaining a certificate. The records will in the ordinary course of business reach the Commissioners, and they will, no doubt, be anxious to find out the amount of attendance which has been given. If the returns sent to the Commissioners are incomplete, the actuarial experts may draw from them statistical results which will be erroneous, and the error will be gravely to the disadvantage of the whole body of medical practitioners. There is no doubt that any arguments based upon this year's records, taken as a whole, would be faulty, because they would be founded

on an under-statement of the work done. But it is desirable that this source of error should be eliminated, and we would urge all practitioners who are on panels to be careful that every item of their work is properly recorded; failure may lead to the formation of very incorrect estimates of the amount of work actually done, and these incorrect estimates may be used with fatal effect in the future as an argument for reducing the present rate of remuneration, or more probably for securing the treatment of dependants for a comparatively small additional payment. Forewarned is forearmed. Attention may particularly be directed to the matter of giving medical certificates, and especially the continuing certificate which a busy practitioner is perhaps apt to look on as a matter of form. It is, however, a matter of legal form carrying with it a serious legal import. Such a certificate may be produced at any time in a court of law, or before the Medical Service Subcommittee in a case of complaint upon which the professional reputation of the giver may depend. The responsibility attaching to the giving of certificates should make practitioners exceedingly careful not only in considering whether a certificate should be granted, but also to record its issue. This obligation to himself and to the profession is all the greater in view of the general charges recently so freely made in certain quarters against the profession of carelessness and encouragement of malingering or of that common complaint, disinclination for work, which Mr. Spanton a good many years ago dignified by the name of "ergophobia." The thoughtless or culpable action of a few may have a serious effect in undermining the confidence placed in medical certificates. We would therefore urge doctors to remember that they cannot be too careful in signing their names to documents the full import of which no layman can adequately assess, and as to which it is, therefore, incumbent on the members of the profession to justify the trust which is reposed in them.

A LESSON IN UNITY.

The Brighton guardians, at a meeting specially convened for the purpose, have resolved to appoint an operating and consulting surgeon at the workhouse infirmary at a salary of 100 guineas a year. The history of the controversy in connexion with this appointment is interesting, for it shows clearly the immense value of a united profession in a town. Some two years ago an advertisement appeared in the local press for a consulting and operating surgeon at the infirmary. The proposed duties and emoluments were settled without any consultation with the medical men in the town, and at a hastily convened meeting of the Medico-Political Committee of the Brighton Division it was resolved that the proposed remuneration (50 guineas a year) was inadequate for the services required, and that every effort should be made to induce candidates and prospective candidates to withdraw their applications. The Division was successful. Not a single candidate remained at the day of election, and here the matter rested for a time. Recently the Medico-Political Committee wrote to the guardians suggesting a friendly conference with a view to terminating a position which, on the showing of the guardians, was very undesirable from the standpoint of the patients in the infirmary. This conference, which was held in private, was eminently satisfactory, and as a result the guardians have decided to make the appointment at the fees suggested to them by the Brighton Division. The medical men of the town approached the case in an eminently fair manner. All they asked was reasonable remuneration for work done. The guardians have met them in an equally reasonable way, and the result shows how, with this spirit on both sides and a united front, disputes between medical men and public bodies can be settled to the satisfaction of both.

EARLY MAN AND MODERN RACES.

In his address at the opening of the winter session of the School of Medicine of the University of Birmingham, Professor Arthur Keith returned to the subject of the Piltdown man, and defended his ascription to him of a large brain. In the earlier part of his address Professor Keith set out to show that the many recent discoveries of early man all tended to establish the belief that man of the type of modern man has existed on the earth for a very much more prolonged period than had until recently been supposed possible. He put aside the theory that the type, presenting many simian features, discovered over half a century ago, and known as Neanderthal, represented the stage in evolution which the ancestors of modern man had reached during the Pleistocene period. It had now, he said, been realized that Neanderthal man presented many high specializations, and that he could not stand in the direct line of ascent. Neanderthal man was quite distinct from all modern races, and the difference between him and us was much greater than between a European and a negro. He represented, in fact, a totally different form of human being, and died out in front of modern man in the same way as the Tasmanian disappeared before the European. The investigations of the last fifty years clearly proved that the distribution of mankind, and their separation into widely different races, had been not a rapid but a very slow process. Thanks to the labours of the Archaeological Survey of Egypt, to Dr. Reissner, to Professor Elliot Smith, Dr. Wood Jones, and Dr. Derry, something was known of the people who occupied the lower Nile Valley during the last eight thousand years. Though at every phase of that long period there was found evidence of the arrival of new types—of migrations or invasions of Egypt—there was also clear evidence of the survival of the old type, and Dr. Seligmann had recently shown that certain native tribes near Suakin, on the Red Sea, had features and bodies very similar to the predynastic Egyptians. His final conclusion to be drawn from a study of the ancient inhabitants of the Nile Valley was that though there was evidence of mixture the passage of eight thousand years had left the prevailing human types unmodified except to a slight degree. The explorations of Mr. Henry S. Wellcome in ancient cemeteries in the Sudan have demonstrated that the peculiar tall, slender, long-limbed negro tribes which now occupy the upper waters of the Nile were there at least two thousand years ago. Professor Keith went on to point out that America has afforded further evidence of the permanence of human types. Eleven years ago a skeleton was discovered at Lansing in Kansas, in a stratum beneath a deposit which, according to Dr. Frederick Wright, the leading authority on the glacial period in North America, was formed before the last cycle of glaciation, and therefore at least 12,000 years ago. Yet this man was physically identical with the Indian of the present day. The discoverer, Dr. Hrdlicka did not accept the inevitable conclusion that before the last great glacial cycle there existed in the central states of America a type almost identical with the modern Indian of the same region; but his objection was due to the belief that human types were so liable to variation that it was impossible for them to breed true over a long space of time. To this it was replied that evidence had accumulated which proved that the belief in rapid variation in man was mistaken. For example, the type of man whose remains were found in the Neolithic barrows of England did not differ from the modern type, except as concerned the state of his teeth and the shape of his limb bones. Professor Keith went on to say that he had had an opportunity of examining two discoveries of human remains from Kent so similar in conformation that they might almost have been members of the same family, yet it was fairly certain that they belonged to very widely separated

periods. The one found by Mr. F. G. Bennett at Coldrum in Kent, in the valley of the Medway, at the base of an ancient stone monument, was accompanied only by flints of the Neolithic types; the other, found at Halling on the Medway, was accompanied by flints which belonged not to the Neolithic but to the Paleolithic type, and were similar to those found in the floor strata of French caves, assigned to the phase of Paleolithic culture known as Aurignacian. The interval between the time when the Halling and the Coldrum man lived must, he thought, be counted in thousands of years. How long it was since the Aurignacian period closed there were no accurate means of determining; but a study of the changes in the conformation and form of valleys led to the opinion that a period of thirty thousand years, or perhaps more, must be allowed. The realization of the persistence of human types showed that a very long interval must be allowed for the time necessary, not for the peopling of the world, but for the differentiation of modern man into the well-marked European, Chinese, and Negro types. The argument founded on this is that, as the brains of all modern varieties of man are so much alike in the essential features of their architecture, it is a legitimate inference that a large and moderately complex brain was a common inheritance of modern races—that is to say, that in the common stock from which all modern races have arisen a fairly large human brain must already have been present. Professor Keith holds that the human skeleton discovered by Mr. Reid Moir of Ipswich beneath an undisturbed layer of chalky boulder clay 3½ ft. in thickness is proof of the existence of modern man in England even before the middle of the Pleistocene period, and that evidence of the Piltdown skull puts the date of man on the earth still further back. The remains found with it were those of extinct animals, belonging chiefly to the Pliocene period, and the skull itself presents characters which mark its ancient date. No modern man has such a chin or lower jaw, and, if Dr. Smith Woodward be right in assigning the canine tooth subsequently found at Piltdown to this skull, no human being has been seen with such a simian canine tooth. Yet in many features the Piltdown skull, Professor Keith holds, foreshadowed the modern type, and the question arises whether he was in the direct line of our ancestors. To this Professor Keith replied in the negative, and his reasons may be given in his own words. "I base my opinion on the fact that we know of the remains of two different species or genera of mankind in Europe at the beginning of the Pleistocene—one is the Heidelberg man, the other is the Piltdown. The Heidelberg man was certainly of the Neanderthal type; the Piltdown man is much more of our own type. They are clearly products of a common stock. We must presume, from what we know of man's nearer relatives—the anthropoid apes—that the common ancestor of Piltdown and Heidelberg possessed the ledge-like, overhanging eyebrow ridges which characterize the anthropoid forehead. These ridges have disappeared in the forehead of the Piltdown man; they have been retained by the Neanderthal man. On the other hand, in the Heidelberg jaw the region of the chin already shows human modifications; the Piltdown man retained the simian form. There is, if we may use Mendel's law for this purpose, apparently at least one intermediate descendant of the common Piltdown-Heidelberg ancestor missing — one which shows the human modification of the chin and the disappearance of the ledge-like supraorbital ridge. That missing form would serve well as our ancestor. We must, then, not dismiss as Neolithic burials those human remains which have neither simian eyebrow ridges nor simian chins. I still maintain, as I did before the discovery of the Piltdown skull, that the Pliocene ancestor of modern man was one probably as highly evolved as the aboriginal man of Australia."

THE PATHOLOGY OF PELLAGRA.

Two papers on the pathology of pellagra recently published appear to deserve careful consideration, as both are founded on detailed microscopical study of well marked cases. The first paper in order of time is by Drs. Douglas Singer and Lewis J. Pollock, published in the *Archives of Internal Medicine* last June. They studied fourteen cases, which, they state, all presented unquestionable clinical evidence of pellagra, attended, in all but two instances, by some form of mental disorder. Eleven of the cases died in the acute or subsiding stages of the pellagrous attack; seven of them, presenting clinical symptoms of "central neuritis," died shortly after the skin lesions had subsided. The remaining three patients died of intercurrent disease at varying periods after apparent recovery from pellagra. The nervous system was submitted to microscopical examination in all the cases. In the acute cases the changes in the vessels of the pia were seen in the smallest branches; the intima was thickened, and there was more or less perivascular infiltration. The authors, however, consider that too much stress had been laid on the changes in the blood vessels, and found that the changes in the ganglion cells were extremely marked, and, as they believe, of great importance. In recent cases axonal changes were pronounced, but there was evidence that except when the damage reached the most severe stage the cells were capable of recovery. Their conclusion is that the picture presented by the lesions observed in cases succumbing during an acute attack of pellagra and in cases dying in an interval is compounded of acute and chronic types of reaction, and affords evidence of both acute and chronic intoxication. They lay emphasis on the constant presence, in all the cases examined in which death occurred during or soon after an acute attack, of "central neuritis," a condition which appears to be a primary lesion of the nerve cell. In health the nerve cell has an accurately balanced and adjusted power of repair; when it becomes unable to repair the loss sustained by its functional activity progressive degeneration of the entire neuron follows. Mott has pointed out that in neurons in a low state of nutritional equilibrium degeneration begins in the fine collaterals and terminals and proceeds back to the cell of origin, and Coriat argues that in certain psychoses the loss in weight, diarrhoea and emaciation reduces the neuron to such a low state of nutrition that its reparative power is destroyed, with the result that the entire neuron degenerates, and that the peculiar symptom-complex of central neuritis follows. Singer and Pollock found that this type of change had almost entirely disappeared in two patients who died eighteen months after an attack, though it was definitely present in a mild degree in a third patient who died three and a half months after the attack. They conclude, therefore, that the acute attack of pellagra is often, if not always, accompanied by some general intoxication of a special kind which disappears in some, if not all, cases in which recovery occurs. They find no evidence of local infection of the nervous system with micro-organisms or of chronic changes favouring the opinion that chronic vascular lesions are essential to the picture of pellagra. The second paper, published by Dr. Lucius Nicholls in the *Journal of Hygiene* for July, is based on eight *post-mortem* examinations, and on observations of what he considers to be an identical condition produced in rats by feeding them on the products of decomposing maize meal. The cases occurred in St. Lucia, B.W.I., and the research was carried out in the Quick Laboratory in the University of Cambridge. All the patients were mulattos of the lower class—five women and three men, ranging in age from 26 to 72. Dr. Nicholls's conclusions are based upon a microscopical study of all the organs, and lead him to the opinion that the pathological changes which take place in pellagra are to a great extent due to degeneration of the

capillaries and smaller vessels; this gives rise to stenosis and blood stasis, which cause leakage or actual haemorrhages from the weakened vessels. Thus, he considers, may be explained the atrophy of the tissues due to impaired nutrition, and the eruption on the exposed skin surfaces where solar radiations and possibly other factors accentuate the damage to the vascular supply, with consequent exfoliation of the stratum corneum, bleb formation from exuding serum, and pigmentation from altered haemoglobin. The tissue cells, especially those of the liver, spleen, and alimentary tract, are also attacked. Assuming pellagra to be due to a toxin, Dr. Nicholls would divide the pathological changes into three stages: the initial stage in which the toxin causes degenerative changes in the endothelium of the smaller vessels, and the endothelium and glandular cells of the alimentary system; the acute stage, that in which mental symptoms and skin eruptions first appear, when the toxin damages capillaries and arterioles, causing the repeated haemorrhages, and also acts upon the cells of the organs; and the chronic stage, attended by great fibrosis of the arterioles and capillaries, and general sclerotic changes in the organs, including the spinal cord and nervous system. He enumerates three hypotheses of the etiology of pellagra: (1) That the disease is due to deleterious substance present in or formed in maize meal by micro-organisms; (2) that the disease is due to bacterial infection; (3) that it is due to a protozoal organism carried from the infected to the healthy by the sand-fly. He contends that the evidence in support of the third hypothesis is very frail, and appears to hold the same opinion with regard to the second. Preliminary experiments on animals were made by feeding rats three-quarters grown with decomposing corn meal. The animals so fed developed with great rapidity a condition which presented clinical features resembling those of pellagra in man, while the microscopical changes included all those seen in human pellagrins, with the exception of the advanced arterial thickening and extreme atrophy and cellular degeneration observed in chronic human cases. In conclusion, he states that though several organisms and active principles can be isolated from soured maize, the exact nature or relation of these to the disease have not yet been worked out.

THE PNEUMOTHORAX TREATMENT OF PULMONARY TUBERCULOSIS.

PUBLICATIONS on the subject of artificial pneumothorax in the treatment of pulmonary tuberculosis have lately been numerous; and while in German journals they have dealt chiefly with refinements and modifications of technique, French journals have devoted much space to records of isolated cases illustrating both the advantages and the dangers of the treatment. These accounts of complete recovery or sudden death may interest the enthusiast and the sceptic respectively; but in this country, where the treatment has been only lately introduced, an account of the broad outlines of the treatment, and of the results to be expected of it, is of more value. Such an account is given by Dr. Begtrup Hansen,[1] whose thesis for the Danish degree of M.D. contains a report on the first 100 cases of artificial pneumothorax at Professor Saugmann's sanatorium in Vejlefjord. The treatment failed at the outset in 31 cases, owing to pleural adhesions. In a second class of case a pneumothorax was induced *causa solaminis*, and as a last resort, although severe complications such as tuberculous intestinal disease rendered the chances of permanent recovery trifling. This class, which contained 24 cases, also included those of bilateral disease in which the healthier of the two lungs was extensively and actively involved, and in which experience has shown that a pneumothorax does no good. In a third class of 45 cases an artificial pneumothorax was induced, and though the disease was bilateral, it was not very extensive or active in the healthier of the two lungs. In every case the treatment had been started more than a year and a half at the date of publication. All the patients were in an advanced stage of the disease and many had undergone sanatorium and other treatment without improvement. Broadly speaking, the extent and activity of the disease was the same in the first and third classes. The first class, therefore, in which the treatment was not carried out, serves as a reliable "control." The fate of these cases at the date of publication was: Improvement in 6, no improvement or progress of the disease in 9, and death in 10 cases. Six cases in the first class are not included in this analysis. The result in the third class showed continued improvement in 25, no improvement in 2, and progress of the disease in 4 cases. In several other cases there was temporary improvement. Twelve out of the 45 patients were dead at the date of publication. Only 3 of the patients in the first class ceased to expectorate tubercle bacilli, whereas they could not be found in 21 patients in the third class, although they had been present in every case at the beginning of the treatment. The evidence, therefore, in favour of this treatment is considerable, and, with a careful selection of more or less unilateral cases, the prospects of effecting a permanent recovery in otherwise hopeless cases is considerable. It must, however, be borne in mind that the treatment was supplemented by sanatorium treatment, and that most of the patients were well-to-do, and were not forced to return to work at a too early stage. There was only one case of sudden death during a first injection in this series, and, considering the pioneer work done at Vejlefjord on this subject at a time when the technique of the operation was still being evolved, this result is good. Sufficient data have not yet, apparently, been collected on which to base an opinion as to the duration of the treatment. At present the maintenance of a pneumothorax for at least a year or two by injections of gas at long intervals would seem necessary, and in one of Dr. Hansen's cases the pneumothorax was maintained for three years, at the end of which the lung was allowed to re-expand. But a relapse occurred a year later. Seven other patients, whose treatment had lasted for two years and whose lungs had then been allowed to re-expand, remained well, the period of observation being half a year or more.

[1] *Den Kunstige Pneumo-thorax i Ftisis Behandlingen.* V. Thaning and Appels Boghandel. Copenhagen. Pp. 267.

THE FINLAND BATH.

THE story of the communal or family steam bath of Finland has been told by every traveller in that country, and many readers have perhaps been disposed to think that there was some exaggeration in the descriptions. The facts as related by one to the manner born show, however, that the singularity of this national custom has been by no means overstated. In a book entitled, *Finlande et Finlandais*, containing a series of essays by native writers on aspects of life in Finland, recently edited by Professor Werner Söderhjelm, of the University of Helsingfors, and published in Paris, Professor E. Lampén, who writes on popular hygiene, begins by giving an account of the universal addiction of the people of all ranks to the bath. Finland is a very sparsely populated country, and a great part of its surface, not occupied by lakes and rivers, is still covered by forests—timber, indeed, being its chief article of export. Many forest tracts are not yet utilized, but a certain amount of migration into these unworked districts goes on, and Professor Lampén declares that, like his forefathers of the distant past, the first act of a migrant of to-day, when he has settled on the place of his habitation, is to build a wooden bath-house; in it the family lives by day, takes a bath in the evening, and sleeps by night; later on he builds barns as he wants them, and

finally a house to dwell in. On the walls of the bath-house are shelves one above another to the ceiling. The hearth is in one corner, and piled upon it are large stones on which a fire of logs is kept burning all day. In the evening the whole household assembles, and each person, having undressed, disposes himself or herself on a shelf. Then hot water is poured on the red-hot stones, and instantly the room is filled with steam. The bolder spirits choose the upper shelves, where the heat is most intense, and there is a sort of bravado in bearing the highest temperature. When they have had enough of it the bathers get off their shelves have a douche of tepid water, and go out into the open air whatever its temperature may be. In summer they lie down on the ground until the surface of the body, reddened by the heat, has resumed its natural colour; in winter they dry themselves rapidly, though some of the bolder spirits may first roll in the snow; in any case, the rule to dress in the open air is absolute. The bath is very often taken every day at all seasons of the year, and always in August, when days are long and harvest work hard. During the bath a bunch of birch twigs may be worn at the waist, but otherwise every one is without any covering, and no harm results. In certain districts custom requires the sexes to take the bath at different hours, and in Helsingfors most apartments have bathrooms, in many cases with hot water laid on. Many workmen's lodgings in that city have bathrooms, but where this is not the case the number of public baths is so large that a peasant who migrates to the capital finds no difficulty in keeping up his practice of taking a bath daily. According to Professor Lampén the Finlanders have followed the custom from time immemorial, and he thinks they may have derived or inherited it directly from the Sarmatians who, as early as the beginning of the Christian era, were, it is said, in the habit of taking vapour baths prepared by pouring water on stones heated in the fire. Experience has convinced the people of Finland that the steam bath, in addition to its cleansing virtue, possesses a certain therapeutic use. It is considered a sovereign remedy for a chill or fever in the earliest stage to put the patient on the hottest shelf in the bath-house and to dose him with brandy; if this combination fails to produce perspiration the doctor is sent for, but there is a proverb to the effect that when bath and brandy fail death is at hand. For muscular stiffness and joint pains the steam bath is combined with rubbing, and in every parish, Professor Lampén says, there are numbers of old women skilled in massage. Finally, he tells us that if there is no obstetric clinic at hand a woman always goes to the bath-house when labour sets in, and when the critical moment is at hand the room is filled with steam. It is believed that in this way the pains of labour are diminished, and it is suggested that as the room and its furniture are so frequently exposed to the action of hot vapour, they must be clean, if not sterile, and that therefore the risk of puerperal infection is diminished.

THE WEST AFRICAN MEDICAL STAFF.

IN the Educational Number for the past two or three years we have felt justified in speaking of the West African Medical Staff in terms which, though carefully qualified, might fairly be interpreted as indicating a belief that this service offers the prospect of a satisfactory career to those who obtain admission to it. It remains to be seen, however, whether the same view will be possible when the date for the issue of the next Educational Number arrives. Some doubt on this point is inevitable, because for the past few months there has been a distinct alteration in the tone of the communications that reach us in regard to this service. These are not always from those who belong to it, or even exclusively from members of the medical profession. For three years, roughly speaking, the Colonial Office in its administrative control of the medical affairs of the West African Colonies and Protectorates has had the advantage of the co-operation of an advisory committee, and it seemed reasonable to expect that the joint wisdom of these two bodies would suffice to prevent the occurrence of anything likely to injure the budding reputation of the West African Medical Staff as an attractive service. At present the tendency towards discontent seems to be localized in Nigeria, and has not reached a sufficient degree of acuteness to make it other than quite an easy task for the Colonial Office to insure that it shall promptly cease. Governors come, and Governors go, but the West African Medical Staff remains, and it would be disastrous if some particular Governor were allowed to leave behind him a legacy of profound discontent among the medical men serving the Government on the West Coast of Africa, and thus bring about a repetition of the unhappy condition of affairs which led to the appointment of a Departmental Committee in 1908. Economical government is, no doubt, an excellent thing in its way, but it would hardly be worth while to save a few hundred pounds a year by a policy which in the case of junior men could fairly be interpreted as one of pinpricks, and in the case of older men both as a breach of promises made to them when they entered the service, and as destructive of the belief that good work would eventually carry one or other of them to its head.

SCHOOL MEDICAL OFFICERS.

THE meeting of assistant school medical officers and school medical officers engaged in the medical inspection of school children, convened by Dr. Hutt, was held on October 10th, at the offices of the Society of Medical Officers of Health, under the chairmanship of Dr. Herbert Jones. Those actually engaged in the work of medical inspection of school children were well represented. In the course of the discussion the advisability of school medical officers and assistant school medical officers joining the Society of Medical Officers of Health was suggested on the grounds that the society could place at the disposal of its members an organization which was the result of the experience of many years; it had considerable funds at its disposal, in addition to a well-established journal. The chairman pointed out that the constitution of the society permitted any medical practitioner engaged in the medical inspection of school children to become a member, and that women were eligible as well as men. It was resolved to form a group within the Society of Medical Officers of Health of medical officers engaged in the school medical service, in order that the views of medical inspectors of school children should be adequately placed before the Society of Medical Officers of Health. Drs. Hutt and Ashkenny were appointed to act as honorary secretaries *pro tem.* for the group, and were instructed to inform the council of the society of the formation of the group, and to make arrangements for its first meeting to take place on November 7th.

THE ELECTRICAL HOUSE.

WHAT is described as the up-to-date house of the twentieth century is a popular feature of the Ideal Home Exhibition at Olympia. In this house most of the domestic service is carried out by electricity. From the cleaning of the boots to the heating of the curlers, electricity is put to every application which ingenuity can suggest. Some of the apparatus has, we believe, come from Paris; but the triumph is really due to the electrical supply companies of London, which have combined to demonstrate in a fearful and wonderful manner what

electricity may accomplish in the household of the future. The kitchen resembles a signal-box in the multitude of its switches. By pressing the appropriate knob food is cooked, eggs whipped, clothes ironed, or knives cleaned. Electricity proves that it rules the world, for here it rocks the cradle, not to speak of heating the water in the bathroom and drying the towels, pulling aside the casement curtains, and assisting the toilet. The sensation culminates in the dining room, which, by the way, is rather too pungently ozonified, for through a diaphragmatic opening in the table wagons bearing the courses make an unassisted ascent, glide round on a circle of rails, and—so civilized is modern electricity—stop in front of the ladies first. The flesh-and-blood servants are out of sight and mind, but they are probably more responsible than the company appreciates, for they hear all that is said through an electrophone concealed in the table decorations and keep an eye upon things by an arrangement similar to the conning-tower of a submarine. There is certainly something magical in the way in which the dishes prove as responsive to a beckon as the most sensitive waiter, but whether they come round afterwards for a gratuity we cannot say. We left after the fish.

THE CENTRAL INSURANCE DEFENCE FUND.

THOSE guarantors of the Central Insurance Defence Fund who have not yet responded to the call of 20 per cent. of their guarantee are asked to send the amount due on the call as soon as possible. One of the objects with which the fund was established was to provide compensation or pecuniary assistance for practitioners who incurred loss in consequence of action taken through loyalty to the profession, and it will have been observed from the reports of the proceedings of the Insurance Act Committee that it has frequently had to consider applications for assistance from the fund. Full information as to all such claims is obtained by the Committee, and the circumstances of every applicant are carefully examined. Assistance is granted in cases in which the need for it is established, and it is hoped that the call of 20 per cent. will suffice to meet all the claims. This expectation can only be fulfilled if all the guarantors respond to the call. Many sums are still outstanding, and it is requested that they may now be paid. Cheques should be made payable to the Central Insurance Fund, and forwarded to the Medical Secretary, British Medical Association, 429, Strand, London, W.C.

THE recent outbreak of typhus fever in Glasgow was associated with old clothes and rags, and on the recommendation of Dr. Chalmers, M.O.H., the corporation has now resolved to insert in a provisional order at present before Parliament an application for power to inquire into the sources of old clothes and rags bought by merchants in the city.

SIR JOHN BYERS, of Belfast, has contributed this week an article on proverbs referring to articles of food in use in Ulster, as an addendum to the more general article published on September 27th, and other essays on the dialect, folk-lore, and sayings of Ulster have been noticed in our columns. We understand that he is giving his leisure time to the preparation of a work on the subject. It will include a glossary of local words, or words having a special local usage.

IN a presidential address before the Glasgow Medico-Chirurgical Society, on October 3rd, Mr. A. Ernest Maylard indicated a doubt as to whether dilatation of the stomach ever existed in an uncomplicated form, or could be caused by simple chronic gastric catarrh. He thought it more probable that both conditions were the outcome of some obstruction to the abnormal escape of the gastric contents. If this were true, there should be early resort in these cases to surgery instead of prolonged dietetic and medicinal treatment, which usually proved merely palliative.

England and Wales.

[*FROM OUR SPECIAL CORRESPONDENTS.*]

MANCHESTER.

PROFESSOR DELÉPINE.

DR. SHERIDAN DELÉPINE, Professor of Public Health and Bacteriology, has now been officially connected with the Manchester University for upwards of twenty-one years, and on October 10th he was entertained at dinner at the Midland Hotel, Manchester, by former workers in his laboratory, and an address was presented to him signed by over 200 of his former students. Dr. Newsholme presided, and referred in the highest terms to Professor Delépine's pioneer work in applying pathology to public health work. The toast of the evening was proposed by Dr. Coutts, who said that not only was Professor Delépine eminent as a scientist, teacher, and organizer, but his influence had spread throughout the world through the many important positions as public health officers held by his former students. The toast was supported by Dr. Greenwood, and Dr. W. J. Howarth presented the address, in which former students expressed their affectionate regard for Professor Delépine and their admiration of his work for the Manchester University and the students who came under his care; it added that the Public Health Department which he had built up was one of which the university and the city of Manchester might justly be proud.

Professor Delépine, in replying to the toast, said that the Manchester Public Health School had been fortunate in the quality of the men that had passed through it. No less than a hundred sanitary authorities were connected with the laboratory, and he suggested that as soon as opportunity arose steps should be taken to promote the establishment in Manchester of a well-endowed chair of preventive or State medicine.

Sir Edward Donner, chairman of the advisory committee of Professor Delépine's department, and Dr. Niven, medical officer of health for Manchester, expressed their high appreciation of the work done by Professor Delépine, which had resulted in making the Manchester Public Health School probably the finest in the country.

NEWCASTLE-UPON-TYNE.

NEW CHAIRS IN THE COLLEGE OF MEDICINE.

THE University of Durham College of Medicine is about to establish three new chairs in the college—diseases of children, throat and ear, and diseases of the skin. The hospital facilities in Newcastle offer ample opportunities to students to acquire practical knowledge of these subjects. Attendance upon the classes will at first be optional but will ultimately become compulsory. Care, however, must be taken not too heavily to overload the medical curriculum, which is already pretty well weighted.

NORTHUMBERLAND AND DURHAM MEDICAL SOCIETY.

On October 9th a large number of members of the Northumberland and Durham Medical Society, Durham medical graduates and students attended the meeting of the society to listen to the address given by Mr. James Berry, of the Royal Free Hospital, London, on malignant diseases of bone, a subject upon which Mr. Berry is a recognized authority. The address, which was appropriately illustrated by specimens and slides in the epidiascope, was listened to with marked attention by the large audience, and flatteringly spoken of by Professor Rutherford Morison in his vote of thanks.

In the evening the annual banquet of the society took place, when Mr. Berry was the principal guest. In a speech not less reminiscent and indicative of his personal obligations than appreciative of the work done by Mr. Berry, Mr. W. G. Richardson gave the health of "Our Guest." This was appropriately acknowledged by Mr. Berry. One speech which was much appreciated was that of Mr. M. P. Griffith-Jones, of the Northern Circuit. A kinder and truer compliment has seldom been paid to the medical profession than that by him in proposing the

Northumberland and Durham Medical Society. The toast was acknowledged by the president, Dr. Auburn Wilkinson of Tynemouth.

BIRMINGHAM.

Sanatorium Benefits.

A report on the administration of sanatorium benefit in Birmingham during the year ended July 14th last states that the committee has entered into an agreement with the Birmingham Corporation for a period of thirty years from July 15th, 1913, under which the Corporation will provide the whole of the institutional treatment of insured persons suffering from tuberculosis, recommended by the committee, within the limits of the accommodation and facilities provided by the Corporation's scheme for insured and non-insured persons. The scheme when in full operation will include the following accommodation:

Residential Institutions.

Yardley Road Sanatorium (including 50 beds reserved for children)	199 beds
Salterley Grange Sanatorium	68 ,,
West Heath Sanatorium	52 ,,
Romsley Hill Sanatorium: 100 beds provided by the Hospital Saturday Fund Committee, the Corporation having arranged for the use of	90 ,,
	409 ,,

Dispensary.

Broad Street Tuberculosis Dispensary (capacity, 2,000 patients a week).

Tables appended to the report show that 1,783 applications for sanatorium benefit were received (1,102 males and 681 females); of these, 63 males and 58 females were ineligible on grounds other than health. Of the 1,039 males referred by the Committee to the medical adviser for examination 908 were members of approved societies, while 527 of the 623 females came under the same category; 834 males and 533 females were examined, 68 males and 20 females failed to attend for examination, and 137 males and 70 females were awaiting examination at the close of the year.

Sanatorium treatment was recommended for 551 males and 347 females; in the case of 337 males and 206 females for a course of six weeks; 182 males and 152 females were ordered dispensary treatment. Domiciliary visits were suggested for 89 males and 31 females.

One of the tables shows the occupational incidence of pulmonary tuberculosis, from which it appears that the engineers sent the greatest number for treatment. The brass trade sent 130 males and 18 females; there were 104 general labourers. There were 103 domestic servants (including charwomen) on the list; while 66 female press workers and 36 clerks were other heavy totals on the female side. The residential incidence varied from the 3.9 per 1,000 in St. Bartholomew's Ward to the 0.2 in North Erdington. The average for the whole city was 1.9 per 1,000.

The income for the year was £12,697 9s. 7d., and the expenditure £11,849 12s. 6d., divided as follows:

	£	s.	d.
Maintenance at sanatoriums	6,267	17	0
Dispensary	1,142	15	6
Domiciliary (estimated)	3,622	10	3
Medical examinations	393	0	0
Administration expenses	350	0	0
Incidentals	73	9	9
	£11,849	12	6

Complimentary Dinner to Colonel W. H. Bull.

The officers of the Birmingham units of the R.A.M.C.(T.) entertained Colonel W. H. Bull, K.H.S., V.D., Assistant Director of Medical Services, South Midland Division, at dinner on October 3rd, in the Officers' Mess at Great Brook Street Barracks, in honour of his recent appointment as Honorary Surgeon to the King. Lieutenant-Colonel F. Marsh presided, and in proposing Colonel Bull's health, referred to his period of service of over thirty-five years in the Volunteer and Territorial Forces, and to the great interest he took in his work, and the keenness and energy he displayed. He expressed the great satisfaction felt by every officer, non-commissioned officer, and man in the units on the distinguished honour conferred on him, and conveyed to him their most cordial and heartiest congratulations. Colonel Bull thanked the units for their kind congratulations and hospitality, and referred to the excellent manner in which the recent annual trainings in camp had been carried out. He paid a high tribute to the work done by the officers and by the adjutant, Captain Bramhall, R.A.M.C. He was pleased to say that the average strength of the R.A.M.C. units in the South Midland Division was well maintained, and that the Director-General had expressed his satisfaction thereon.

LONDON.

Ambulance Service for the Metropolis.

At the first meeting of the London County Council, after the summer recess, held on October 14th, Mr. E. Smallwood called attention to the case of a school teacher in Stoke Newington who was taken ill in the street, and conveyed on a costermonger's barrow to a hospital, where she died a few hours later. He asked the Chairman of the General Purposes Committee whether any indication could be given as to the early removal of the reproach to London of the absence of an efficient ambulance service.

Mr. Ernest Gray, the Chairman of the Committee, in reply, said he was glad to be able to inform the Council that Parliament had now granted the powers whereby the Council might co-ordinate the ambulance services of London. He had now no doubt that an efficient ambulance service would be provided for the whole of London—he hoped before the end of the present year.

WALES.

"The Glamorgan Red Cross Gazette."

The organization of Red Cross voluntary aid detachments has made great progress in South Wales, especially in the county of Glamorgan, and we have received the first number of the periodical, *The Glamorgan Red Cross Gazette*, which is to appear three times a year—in September, February, and May. It is intended to be a medium for disseminating news about the work of the detachments in the various districts and spreading information as to the nature and aims of Red Cross work. The first number contains a paper on the development of Red Cross voluntary aid work, by Lieutenant-Colonel A. W. Sheen, R.A.M.C.(T.), the County Director. In this, after insisting upon the necessity of a sound knowledge of the rudiments and foundations of the work and a good general training, he goes on to indicate the need and desirability of a certain amount of specialization. He suggests that, at a later stage, the men's detachments should give special attention to the moving and care of sick convoys, the fitting up of buildings as temporary hospitals, and the provision of proper sanitation for building or areas. The women's detachments would undertake to find the staff of an improvised hospital, to provide nurses and equipment for an ambulance train, and to give special training in the nursing of infectious diseases, such as typhoid. The members of the men's detachments in specializing for convoy work would make themselves acquainted with all the different vehicles likely to be available, and the methods of adapting them and fitting them up; how, for instance, to arrange a motor car for patients, and how to drive it, and how to fit up an empty goods wagon so that patients may be slung therein comfortably on stretchers. Another detachment would take up sanitation, learning methods of purifying water, of disinfecting and disposing of excreta, of disinfecting clothing and buildings, of constructing incinerators, and of attending to the general sanitation of camps. It would be the duty of the women's detachments to interest themselves in the staffing of an ambulance train and the method of converting a goods wagon into a travelling kitchen and the provision of portable foods, dressings, and bed coverings. The men and women's detachments working together would undertake the organization of a mobile clearing hospital, which would move immediately behind the field ambulance of the Royal Army Medical Corps. He indicates the equipment which a detachment would need in order to carry out this programme, and urges also that a Red Cross dépôt should be formed in the county where equipment should be accumulated, and from which

nursing equipment for the instruction of first aid and nursing classes and of candidates for enrolment and general equipment would be issued to detachments on loan. The *Gazette* also contains a letter from Mr. Lynn Thomas, honorary organizer of Red Cross work in the county of Glamorgan, which expresses the hope that eventually there may be a Red Cross gazette for Wales. The letter contains also an idea which may, perhaps, act as does a crystal added to a saturated solution to produce a brilliant formed precipitate. To some minds there is always a want of reality in military exercises and preparation for war, because the possibility of such a catastrophe appears remote. But voluntary aid detachments and all that they imply might be turned to account in the emergencies of civil life, such as that by which the country was shocked on October 14th. They could also do good work in assisting in the war against tuberculosis. In support of this idea Mr. Lynn Thomas quotes the opinion of Professor Harvey Cushing as expressed in the eloquent and practical address which he gave at the International Medical Congress in London on realinements in greater medicine. If the idea were developed and then carried out in practice it would serve two useful purposes; it would give voluntary aid detachments a greater sense of responsibility, and would afford them opportunities of testing their organization in emergencies while at the same time rendering an important service to the community. The *Gazette* states that several prizes are being offered to voluntary aid detachments for competition. Lady Aberdare is offering a cup for competition by the men's detachments, and Mrs. Lynn Thomas a cup for the women's detachments in Glamorganshire. In future at the Welsh National Agricultural Society's annual meetings there will be two ambulance competitions—one for a silver challenge shield presented by Mr. Lynn Thomas for ambulance work, and another for a silver challenge cup, value £50, presented by Mrs. Lynn Thomas for home nursing. The same lady has placed at the disposal of the National Eisteddfod Association a prize of £50 with a medal for the best essay in English embodying a scheme for diffusing a knowledge of first aid, nursing, and domestic hygiene in Wales. The essays must reach the general secretary, Eisteddfod Offices, Bangor, on or before July 1st, 1914. The *Gazette* is edited by Miss E. P. Hughes, Penrheol, Barry, with the assistance of Miss S. Corbett, Pwllypant, Caerphilly, and is published by E. J. Llewellin, Cadoxton-Barry, Cardiff.

Scotland.

[*FROM OUR SPECIAL CORRESPONDENTS.*]

The Chair of Bacteriology in Edinburgh.

The inaugural lecture in connexion with the newly founded Chair of Bacteriology in Edinburgh University[1] was given by Professor James Ritchie on October 7th, in the M'Ewan Hall. Principal Sir William Turner, who presided, referred to Dr. Ritchie's work as professor of pathology in the University of Oxford and as superintendent of the laboratory of the Royal College of Physicians in Edinburgh, and alluded to the circumstances in which the late Mr. Robert Irvine had made the foundation of the chair financially practicable.

Professor Ritchie opened his lecture with a graceful appreciation of Mr. Robert Irvine's generosity and interest in research: "His leisure was dominated by the spirit of inquiry and his house was the centre of a scientific coterie." The history of bacteriology was then traced and reference made to the three great names of Pasteur, Lister, and Koch; the science was still young; it had not attained its jubilee, but it had already made contributions of the highest value, not only to medicine but also to many other human interests. Industries connected with food preservation had had their conditions revolutionized, and the place which bacteria played in the fertilization of the soil was well recognized and acted upon in agriculture. In medicine bacteriology was a branch of pathology, for the disease-producing bacteria were the most important of all micro-organisms; but it was also closely related to physiology, and scientific therapeutics owed much of its recent success to it, as did likewise preventive sanitation. Professor Ritchie closed his address with a statement as to the function of the new professorship; it was to be primarily for the fostering of research, and secondarily for the teaching of the science of bacteriology. The position of the subject in Edinburgh University was unique. There would be some teaching of students; but bacteriology was essentially a post-graduate study, and the chair was therefore to be rather a research than a teaching one. This announcement was in some respects the most important matter in the inaugural lecture, and Professor Ritchie rightly emphasized it; it was the keynote in the address, and it will be well if the university authorities are able to keep it sounding.

[1] British Medical Journal, May 17th, 1913, p. 1076.

The Teaching of Clinical Medicine.

Sir Thomas R. Fraser (who has recovered perfectly from his accident of last winter), in his opening address on October 7th to the clinical medicine classes in the Edinburgh Royal Infirmary, described the new arrangements which were now coming into action. These arrangements have been explained in the pages of the Journal (August 16th, 1913, p. 434), and they were summarized by Sir Thomas Fraser as follows: An incorporation with the university had been effected of the whole of the ordinary physicians, assistant physicians, and tutors into one concrete body without distinction, in all essential points, between university professors and extramural teachers. The ordinary physicians have become university officials, with the title of senior lecturers in clinical medicine, the assistant physicians as lecturers, and the tutors as university tutors or assistants. All of these teachers, along with the professors of clinical medicine, had thus, he said, been fused into one body to work for one common purpose, and without the semblance of two different bodies, each desirous, it might be, of maintaining separate interests. Sir Thomas Fraser alluded also to the extended responsibilities which would fall upon the assistant physicians (now lecturers under the scheme); they would for the future take a larger share in the management of the patients in the wards, and would in fact assume the position and functions of the *chefs de clinique* who had for many years existed with much advantage in the hospitals of France and Germany.

There is much to be said in favour of the new arrangements for the teaching of clinical medicine in the Edinburgh Medical School and for some other changes which have tended to break down the separation between intramural and extra-mural lecturers and lecturing; but there are many who view with some alarm and foreboding the gradual extinction of the extra-mural school which seems thus to be coming nearer, the change taking place with accelerated speed. If, however, the healthy rivalry which has existed between the teachers inside the university and those outside its walls can be maintained when all are, so to say, inside, then no great damage is to be apprehended, and for purely administrative, teaching, and examining purposes simplification with increased efficiency may fairly be looked for.

On October 6th the joint committee of the University Court and the managers of the Royal Infirmary met to consider the appointment of a professor to the Moncrieff Arnott chair of clinical medicine which has so recently been founded (Journal, May 17th, p. 1089). The committee adjourned until October 11th, when a short leet of two names was selected to be recommended to the University Court so that it might appoint one of the persons named to the chair. The two names sent up to the University Court were Dr. William Russell and Dr. J. J. Graham Brown. The appointment is to be made on Monday, October 20th, when the court meets.

Sanatorium for South-East of Scotland.

The Local Government Board for Scotland received on October 10th representatives of the county councils of the counties of Berwick, Haddington, Linlithgow, Midlothian, Peebles, Roxburgh, and Selkirk, to discuss the terms of a draft order prepared by the Board providing for a combination of these counties for the erection of a sanatorium. The amendment of certain details in the draft order was discussed at length, and it was arranged that a representative of the county councils should adjust with the Board

the terms of the amendments necessary to give effect to what was arranged. When this is completed the draft order as amended will be submitted to individual counties for approval.

Ireland.

[FROM OUR SPECIAL CORRESPONDENTS.]

A Medical Officer's Fee.

The Local Government Board has now replied giving its reasons for objecting to the payment of a fee of 2 guineas to Dr. O'Dwyer, medical officer of Granard Dispensary district, for assisting, while he was on his holiday, his locumtenent in a difficult midwifery case. The Local Government Board says that it attaches much importance to the principle involved, and points out that the medical officer was absent on vacation with the view to benefit his health, and was in receipt of his full salary, and that the temporary medical officer was employed as his locumtenent by the guardians at a fee of £4 4s. a week. Similar claims to that of Dr. O'Dwyer, on the rare occasions on which they have been put forward, have invariably been refused, as the Board considered that payment of a fee to a medical officer for assisting his temporary substitute would be open to serious objection and would lead to grave abuse. The Board is of opinion that the guardians are bound to safeguard the interests of the ratepayers in the present instance, and should, so as to avoid the possibility of a surcharge, instruct their solicitor to defend the proceedings in the county court, and if the decision should be adverse to them, to take the necessary steps to appeal to the assizes. Dr. O'Dwyer is to be put to all this trouble, therefore, to obtain payment for work which he was obliging enough to do, though he was entitled to refuse to do it, in which case another doctor would have had to be sent for and paid the same fee. This seems rather a troublesome and expensive method of preventing a "grave abuse," which is not the least likely to arise.

Scarlet Fever.

At the last meeting of the Clonmel Corporation, Dr. P. O'Brien, medical officer of health, reported that an unusually severe epidemic of scarlatina had prevailed in the town for some weeks. All precautionary measures had been taken, including the closing of the schools. He was of opinion that the epidemic had reached its present dimensions because cases were not placed under medical care, and were not notified to the sanitary authorities. At the meeting of the board of guardians it was stated that there were 30 cases of fever in the hospital. An outbreak of scarlet fever is also reported from Borramount, co. Wexford, and from Malahide, near Dublin, where two children were attacked in one of the District Council's cottages, and removed to Balrothery Workhouse Hospital. As there are forty other labourers' cottages in the immediate vicinity to which the disease was in danger of spreading, all the members of the family in which the fever occurred volunteered to go in the workhouse cab to Balrothery, where the clothes which they were wearing were disinfected.

Cattle in a Bedroom.

At the last meeting of the Loughrea Rural District Council, Dr. Geraghty, M.O.H., reported on the insanitary condition of a house, and recommended that the Council should order the occupier to limewash his house, and to remove the cattle and fowls that occupied one of the bedrooms. The Council ordered the owner of the house to be prosecuted if he failed to comply with the sanitary notice within a week.

Royal Academy of Medicine in Ireland.

At the annual general meeting on October 10th the following officers were elected for the coming year:

President, W. G. Smith; *General Secretary*, J. Alfred Scott; *Secretary for Foreign Correspondence*, Sir John Moore.

President of the Medical Section.—J. O'Carroll.

President of the Surgical Section.—R. D. Purefoy, P.R.C.S.

President of the Obstetrical Section.—M. J. Gibson.

President of the Pathological Section.—J. B. Coleman.

President of the Section of Anatomy and Physiology.—B. J. Collingwood.

President of the Section of State Medicine.—T. P. C. Kirkpatrick.

Medical Superintendent's Pension.

At the last monthly meeting of the Tyrone and Fermanagh Asylum Board Dr. Carre, who had resigned after about thirty-three years' service in that institution, was unanimously granted a superannuation allowance of £540. The salary of the new medical superintendent was fixed at £500 per annum, with £100 allowances.

Pharmaceutical Society of Ireland.

At the thirty-eighth annual meeting of the Pharmaceutical Society of Ireland, held in Dublin last week, the President stated that the society had never been in so prosperous a position. There were 1,860 names on the register, an increase of 54 since last year. In the preliminary test 59 candidates passed by examination and 31 with certificates from other bodies, making a total of 90. The pharmaceutical licence was obtained by 42 candidates. The preliminary examination had been altered, in accordance with the Privy Council Order of August 12th, by the omission of chemistry, botany, and physics. This Order should attract an increased number of students who could easily take this modified course before commencing their apprenticeship. The attendance at the various classes of the society's schools in practical chemistry and materia medica numbered 63, showing a marked increase over the last two years. The Law Committee, in performance of its work of seeing that the law was respected, was compelled to prosecute in several cases in which it was alleged that prescriptions had been compounded by unqualified persons or poisons sold without licence.

Correspondence.

ON DOSES IN THE NEW "PHARMACOPOEIA."

Sir,—In your issue of October 11th a letter appears from Dr. Leftwich advocating the simplification of doses. I most heartily join with him in the hope that in the new *Pharmacopoeia* the table of doses should be simplified. I am quite sure that Dr. Leftwich is perfectly right in saying that inability to remember the proper dose of a medicine has sometimes led to the most suitable medicine not being prescribed, and on other occasions has even caused the death of the patient, so that simplification is urgently needed.—I am, etc.,

London, W., Oct. 13th. Lauder Brunton.

MAXIMAL AND MINIMAL BLOOD PRESSURES.

Sir,—I was much interested to read Dr. Halls Dally's lecture on blood pressure. It was he that first introduced Pachon's instrument to me some years ago. Since then I have been working at the question of diastolic pressure, testing the accuracy of methods, etc. The results I hope to publish shortly, but I may state here that:

1. The maximum oscillation does not correspond to the minimal pressure, and its position varies with the capacity of the vessels peripheral to the armlet.

2. All instruments built on the principle of Erlanger's instrument are inaccurate.

3. It is just possible to obtain the diastolic pressure by oscillation methods, but so complicated that clinically such methods are useless.

I agree with Dr. Halls Dally that the diastolic pressure is very important, and that Pachon's instrument used with a double armlet is useful for systolic pressure, and if the bag is made of non-distensible material gives a fairly accurate estimation of the oscillation of the arterial wall.—I am, etc.,

London, E.C., Oct. 14th. Malcolm Donaldson.

EYESIGHT AND NAVIGATION.

Sir,—I am much obliged to you for your very courteous notice of my recent publication on eyesight and navigation.[1] The only matter which I would perhaps like to point out is as to the certainty of a man with hypermetropia being able to navigate quite safely. Your reviewer seems to take the ground that because a yacht is small, and therefore of

[1] British Medical Journal, October 4th, p. 884.

little velocity, that that makes a change on the conditions of the problem. Here it is not a question of the velocity of the vessels at all, but purely a question of the velocity of light, which for any finite distance may be regarded as infinite. So soon as ever a vessel appears on the horizon a hypermetropic man will see it equally well with an emmetrope; I myself, with a dioptre and a half of hypermetropic astigmatism against the rule, have no difficulty in the matter whatever. It is purely a question of the velocity of light, not of the velocity of the vessels. Moreover, a man with that amount of hypermetropia has not the least dubiety as to which vessel is to clear the other. There are definite rules laid down by the Board of Trade on the subject, and it is not a question of speed but a question of position which determines the matter. I have no doubt whatever that anybody with 2 or 3 dioptres of hypermetropia is perfectly as safe as a man who is approximately emmetropic.

I think it also possible, although I am not certain of it, that a man with a weak myopia may be safe; certainly I know of one case where a man with 5 dioptres of myopia did pilotage for many a year. The radical blunder has been in attempting to make navigational ability a function of visual acuteness. Again let me express my thanks alike to you and to the reviewer.—I am, etc.,

Glasgow, Oct. 9th. FREELAND FERGUS.

P.S.—I have no doubt whatever that the Royal Navy is annually deprived of the services of many excellent officers by the fact that the Admiralty insists on emmetropia.

ACCIDENTS DUE TO DEFECTIVE SIGHT: A CORRECTION.

SIR,—In a small book that I have lately brought out, *On Cases of Accident to Shipping and on Railways due to Defects of Sight*, which was favourably noticed in the JOURNAL of September 13th, Case 41, the case of the Guisborough accident on the North-Eastern Railway on January 1st, 1908, was included with others in a miscellaneous group of suspicious, although unproved, cases in which a defect of sight in the engine driver if present would have afforded a satisfactory explanation of the disaster. I think the attitude I took was justified by the facts that the report of the Board of Trade inquiry contained not a word as to the driver's sight having been examined after the accident and that I had no access to other information. Your own annotation upon the case in the JOURNAL of April 4th, 1908, was no doubt based also on the Board of Trade report. I have now just heard from Dr. J. G. McBride, the medical inspector to the North-Eastern Railway Company, that the driver, then aged 46, was examined by himself a month after the accident and found to have visual acuity of $\frac{6}{9}$ in each eye and normal colour vision to Holmgren's test. He was injured at the accident, and could not be examined sooner. He has since been tested with Edridge-Green's lamp, and found to be normal. Although the man might possibly have been suffering from slight tobacco amblyopia at the time of the accident, such an interpretation is so much less probable in the light of Dr. McBride's information than it was before, that had I known, when writing the book, what I know now I should not have considered the case sufficiently strong to justify its inclusion in my list. It would have been more satisfactory if the result of Dr. McBride's examination and the reason that prevented this from being made until some weeks after the accident had been incorporated in the report of the Board of Trade Inspector.—I am, etc.,

Hindhead, Surrey, Oct. 11th. E. NETTLESHIP.

THE SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS.

SIR,—In your annotation of October 11th you refer to the difficulties of obtaining suitable cases, and to the disadvantages of producing artificial pneumothorax. One observation certainly holds true—that any form of treatment ought to do better in early rather than in late (one-sided) cases of phthisis, whereas artificial pneumothorax seems reserved for the later cases only.

Having seen the process, may I suggest as an advance on artificial pneumothorax that the production of artificial pleuritic effusion would offer greater advantages in both early and late one-sided cases?

If a splint be required to rest the affected lung, surely a liquid rather than a gaseous medium, following Nature's hint in pleurisy with effusion, should be employed. I would suggest saline infusion, or, perhaps better still, sterilized oil, with the addition of sulphur and creosote in small quantities. This mixture, in my experience in localized tubercle after scraping, is the best dressing for the condition. And if a splint of oil to compress the lung were first employed on dogs, I venture to think the same method, seasoned with sulphur to compress and disinfect the affected lung, might be usefully employed in human subjects.—I am, etc.,

Newcastle-on-Tyne, Oct. 14th. T. M. ALLISON, M.D.

SIR,—May I contribute a commentary to the paper under this heading in the JOURNAL for October 11th, with its rather pessimistic beginning, "The *possibility* of affording *temporary* relief . . ."?[1] Discussing the action of an artificial pneumothorax, Dr. L. Spengler[2] has recorded 15 cases in which it had been induced from nine months to four years earlier. All these patients could do a full day's work, they had neither fever nor cough, and tubercle bacilli were no longer demonstrable.

With regard to the statement, "Statistical evidence as to the proportion of success achieved is not as yet forthcoming," I would point out that, at the International Medical Congress in London this summer, Professor Saugman read a paper in which he analysed 100 cases of advanced pulmonary tuberculosis, in which artificial pneumothorax was prescribed. In 36 cases pleural adhesions prevented the realization of this treatment. These cases were in other respects similar to the 64 cases in which a pneumothorax was induced.. The following comparison, therefore, gives a fair estimate of the benefit to be derived in advanced pulmonary tuberculosis (1) from sanatorium treatment alone, and (2) from sanatorium *plus* pneumothorax treatment. No patient is included in this table for whom a pneumothorax was prescribed less than nineteen months earlier.

Fit for Pneumothorax Treatment (100).	Pneumothorax Effected (64).	Not Effected (36).
1. Able to do ordinary or light work	32	8
2. Unable to work on account of tuberculosis	18	12
3. Dead from tuberculosis	12	14
4. Unknown	0	1
5. Dead from acute complications...	2	1
Not considering the last three, the percentage is as follows:	Percentage.	Percentage.
1. Able to work	51.7	22.9
2. Unable to work	29.0	34.3
3. Dead from tuberculosis	19.3	40.0
4. Freed from tubercle bacilli ...	50	8.6

Striking though this comparison is, it does not yet do full justice to the treatment as confined to practically unilateral cases; for Professor Saugman has prescribed it in cases with the healthier of the two lungs considerably diseased. Even in such cases wonderfully good results may sometimes be obtained; but the practically unilateral cases are those in which, as a rule, the improvement is most dramatic and permanent. I do not suppose one lung is ever perfectly healthy when its fellow is extensively diseased. Cases of severe but unilateral disease, instead of being "counted in units," should be discreetly tucked away with "the Emperor's new clothes."—I am, etc.,

Gorleston-on-Sea, Oct. 13th. CLAUDE LILLINGSTON.

TURBINECTOMY.

SIR,—I am pleased to hear that Sir Robert Woods repudiates the report of his remarks, but think he does not quite meet my criticism. My contentions are that:

[1] The italics are mine.
[2] *Münchener Medizinische Wochenschrift*, February 28th, 1911.

1. It is extremely rare for atrophic changes to follow even a turbinectomy with the spokeshave (complete or incomplete).

2. When such atrophy does follow it is due to the perpetuation of a condition of the mucous membrane present prior to operation. Certainly most of the cases we have in Manchester are associated with excessive secretion of mucus, and these can bear a large loss of secreting tissue with favourable results. It is in the anaemic young girl or the patient with a coexisting sinus disease (ethmoidal and sphenoidal especially) that extensive removal of tissue is undesirable, for it is in just these cases that atrophy occurs in time even without interference.

It is possible to remove a definite strip of turbinal with the spokeshave; my chief objection is that it leaves tags and also may injure the septum, thus requiring some tedious after-treatment. I am awaiting the completion of a new pair of forceps which, I think, will remove with one cut the turbinal in its entire length, or will remove a strip of desired breadth with precision.

With all the remarks of Mr. Stanley Green I cordially agree, especially as to the gratitude of patients for this unorthodox treatment.

Again, I do not think my phrase, "a carefully graduated turbinectomy," is at all contradictory. Much confusion has arisen from the loose way in which the words "turbinectomy" and "turbinotomy" have been employed. Surely turbinotomy means nothing more than cutting the turbinal, and is only part of the technique of performing turbinectomy.

Removal of a portion of the turbinal should not be called turbinotomy—removal of one lobe of the thyroid is a partial thyroidectomy, not a thyroidotomy; similarly with partial nephrectomy, not nephrotomy; partial gastrectomy, not gastrotomy. Removal of a portion of the larynx is not laryngotomy, but a modified laryngectomy. The correct nomenclature should, by analogy, be anterior or posterior turbinectomy, and complete or incomplete linear turbinectomy for removal of the whole turbinal or a strip of the whole length.—I am, etc.,

Manchester, Oct. 12th. WILLIAM WILSON, M.D., B.Sc.

MEDICAL MISSIONS DEPARTMENT, S.P.G.

SIR,—I wish to make known some openings for junior members of the medical profession, which, putting aside other aspects of the work, provide a variety of cases and scope for the performance of important operations greater than commonly fall to the lot of general practitioners in this country. In the majority of these places there can be also the inspiring reflection that there is no other qualified doctor within many miles to whom the patients could possibly apply for the treatment they need. The salaries, except in the case of Rusapi, in Mashonaland, where there is a Government guarantee of £300 besides private practice, are small, but sufficient for comfortable maintenance of unmarried doctors, being the same both for men and women as those offered to the clergy working under similar conditions in the S.P.G. Missions in connexion with which these posts are.

The doctors must be in full sympathy with mission work, but will not be required to do any but their professional work unless they desire it themselves. The vacancies are, for men: (1) Hazaribagh, Behar, India; (2) Rusapi, Mashonaland; (3) Kwamagwaza, Zululand. For women: (1) Ping Yin, North China; (2) Delhi, India; (3) Malacca. In all these places the hospitals are in full working order. Several more men are wanted for China and three women for India, but we could not send them at present owing to lack of funds. Our doctors never enter into competition with private practitioners or those working in Government posts. We appeal to members of the profession who are in sympathy with the efforts which the S.P.G. is now making to meet the great need for medical aid in places otherwise unprovided for to help us by bringing these vacancies to the notice of some who seem suited to fill them.

I shall be glad to answer fully any inquiries made from me about these posts and the needs and plans of this department of the S.P.G.—I am, etc.,

K. W. S. KENNEDY, M.B.,
Secretary, Medical Department, S.P.G.

15, Tufton Street, Westminster, Oct. 14th.

Universities and Colleges.

UNIVERSITY OF CAMBRIDGE.

THE following candidates have been approved at the examinations indicated:

FIRST M.B. (*Part I. Chemistry*).—C. C. Beney, F. H. V. Bevan, I. M. Bickerton, C. M. Billington, C. M. Childe, H. Corsi, S. L. P. Davidson, K. Dykes, T. Fernandez, L. W. Finlow, J. D. Gabb, H. C Gloster, C. G. Guy, G. A. Harrison, H. E. Lambert, R. J. Lathbury, O. G. Misquith, J. R. Mitchell, J. H. E. Moore, G. P. Morris, F. C. Odling, N. Rumboll, K. H. Tallerman, E. B. Verney, J. Whittingdale, M. Wong, F. G. Wood. (*Part II. Physics*): R. C. Bentley, W. L. Berry, F. H. V. Bevan, J. M. Bickerton, C. M. Billington, C. M. Childe, E. D. Collins, H. Corsi, S. R. E. Davies, S. L. P Davidson, K. Dykes, L. W. Finlow, H. Franklyn, H. C. Gloster, H. C. Gunasekara, C. G. Guy, G. A. Harrison, P. R. Hatch, T. S. Hinnell, S. H. G. Humfrey, A. King, H. E Lambert, R. B. P. Lansdown, P. Lazarus-Barlow, P. T. Liang, D. L. Macintyre, L. B. Maxwell, J. H. E. Moore, J. H. Naumann, P. M. Neighbour, R. H. Reece, N. Rumboll, A. N. Solly, F. V. Squires, K. H. Tallerman, W. B. Thompson, E. B. Verney, C. R. P. Wallace, A. T. Westlake, H. L. Willey, H. G. Wimbush, M. Wong, F. G. Wood. (*Part III. Biology*): J. M. Bickerton, C. M. Billington, A. D. Coates, S. L. P. Davidson, T. Fernandez, L. W. Finlow, A. M. Gaselee, H. C. Gloster, N. D. de M. Greenstreet, R. T. S. Gwynne. G. A. Harrison, L. B. Hartley, W. E. Heath, C. R. Hind, R. W. Jackson. P. C. Livingston, D. L. Macintyre, F. P. N. Parsons, H. R. Reece, C. E. Taylor, D. L. Tucker, W. E. Vandrey, E. B. Verney, M. D. Vint, S. Waterworth, A. T. Westlake, J. Whittingdale, D. E. Wijewardern, S. C. Williams, W. T. Williams-Green, M. Wong, F. G. Wood, L. M. Younghusband.

UNIVERSITY OF EDINBURGH.

THE following candidates have been approved at the examinations indicated:

FIRST M.B. (*Zoology*).—Lal S. Anand, San H. Aung, G. Buchanan, E. A. Carmichael, Anna G. Christie, P. C. Datta, H. M. Deans, E. Dickson, J. A. A. Duncan, M. H. A. Fletcher, D. P. Gay, H. A. E. Girby, W. A. Gray, E. F. Griffin, W. A. Hennessy, S. S. Horwitz, J. T. Johnston, A. Klenerman, Y. C. Lee. G. N. Lomax, J. C. M'Cartney, D. M'Eachran, F. P. MacGillivray, R. D. Mackenzie, A. M. MacLachlan, P. B. Maitland, D. A. Miller, J. K. Mitchell, J. C. Moolman, T. B. Moyes, Tin Po Ng, P. V. Paul, K. N. Rao, C. B. Reekie, J. Riesnik, Mary J. D. Rutherford, J. K. Sen, C. Shapiro, J. O. P. Smith, Janet Smith, S. L. Smith, G. Verghese, T. C. Wakefield, J. D. White. (*Physics*).—M. S. Abaza, Y. Y. Chan, P. C. Datta, W. J. Dunlop, V. A. Earnshaw, K. J. Ebsworth, G. B. Flint, A. S. Garewal, H. P. D. Helm, R. MacGarrol, A. G. Mackay, R. A. MacNab, P. V. Paul, Susan A. Robertson, J. Robinson, Mary J. D. Rutherford, R. B. Smith, J. F. Stewart. (*Botany*).—M. S. Abaza, G. Balsillie, R. B. Barnfather, R. E. Batson, J. H. Brink, G. Buchanan, Anna G. Christie, E. Dickson, J. A. A. Duncan, T. S. Duncan, W. J. Dunlop, A. S. Garewal, D. P. Gay, R. N. Gibson, E. S. Jackson, G. N. Lomax, J. C. M'Cartney, D. Mackay, F. A. Meine, J. C. Moolman, J. K. Murray, R. B. Okholm, K. N. Rao, H. H. L. Richards, Susan A. Robertson, J. Robinson, J. K. Sen, J. Smith, J. F. Stewart, C. M. Thomas, D. F. Thompson, M. S. Toukhy, W. C. Tsoi. (*Chemistry*).—W. Bald, P. Barlow, G. P. Burns, N. A. Doggart, A. S. Garewal, F. Gunaratna, E. S. Jackson, N. Jennings, R. M'Garrol, A. R. Matheson, S. D. Nurse, J. Riesnik, Susan A. Robertson, Mary J. D. Rutherford, R. B. Smith, J. A. Stirling.

SECOND M.B. (*Physiology*).—G. S. Barnett, D. Colombos, K. M. Dey, S. L. Dmitrieff, P. W. Edwards, W. N. Greer, T. L. P. Harries, F. J. Hauptfleisch, Jane E. Hay, Wilhelmina W. Hendry, A. Kennedy, A. C. Kirton, Isobel M. M'Lullich, Annie M. Madin, Isabella Morison, D. J. Morrison, J. E. Phillips, G. C. Sahgal, E. O. A. Singer, E. D. Söderström, C. I. Stockley, G. W. C. Sutherland, M. D. Thakore, A. F. de Waal. (*Anatomy*).—W. W. Brown, A. Cleland, W. H. Ferguson, A. B. Grant, W. N. Greer, T. L. P. Harries, Wilhelmina W. Hendry, A. N. Homewood, W. L. Hunter, M. K. Jardine, C. M'Donald, J. M'Garrity, Margaret M. M'Garrity, I. Mackenzie, R. N. Mackenzie, P. D. M'Laren, Isobel M. M'Lullich, D. A. Macrae, W. G. F. O. Morris, D. J. Morrison, G. Nicholson, J. O. Reid, G. C. Sahgal, J. Sellar, J. J. Shannon, W. A. Slack, M. D. Thakore, J. T. de Villiers, Gladys Ward, Gladys R. M. V. Williamson, C. M. M. Zubair.

THIRD M.B. (*Materia Medica*).—T. L. Clark, C. H. H. Coetzee, D. Dunlop, A. J. Ferguson, E. G. M. Gilchrist, M. P. Inglis, H. Jackson, O. D. Jarvis, G. G. S. Johnston, E. Law, G. Lilico, Mary Martin, W. J. Purdy, J. Rodger, A. R. Ross, L. J. Spence, T. J. W. Sveinbjornsson, L. H. Werden, B.A., J. M. Wishart, A. Wotherspoon. (*Pathology*).—T. C. Bowie, A. F. Campbell, J. R. Crolius, J. G. Dobson, R. B. Eadie, E. L. Galgut, Helen M. Gall, Y. H. Hoashoo, P. W. Lam, P. M. Little, T. J. Lloyd, A. L. M'Ilwaine, Mary Martin, E. S. Mellor, G. Schussler, W. Shanks, L. J. Spence, B. P. Varma, J. D. Whitfield, M. E. Willcock.

UNIVERSITY OF GLASGOW.

THE following candidates have been approved at the examinations indicated:

FIRST M B. (B, Botany; Z., Zoology; P., Physics; C., Chemistry).—*W. Adams (B., P.), T. A. J. Aitchison (Z., C.), *R. Aitken (B., P.), J. R. P. Alexander (B., P.), G. W. Allan (Z., C.), T. F. Arnott (B., P.), J. D. Arthur (B., P., C.), J. Ashworth (B., P.), H. E. C. Bacon (C.), H. Bankhead (Z., P.), D. E. Brown (B P.), G. Brown (B., P.), *R. S. Caldwell (B., P.), R B. Cameron (B., P.), W. J. S. Cameron (B., P.), W. M. Cameron (B., C.), M. Chalmers (B.), A. E. Cochrane (Z., C.), H. L. Coulthard (B., P.), J. S. Craig (B., P.), H. A. Cruickshank (B., P.), W. Dempster (B., C.), R. K. Duguid (B., P.), W. Edgar (B., P.), R. Erskine (B., P.), *W. J. Ferguson (B., P.), J. P. Fleming (B., P.), T. Forrest (B., Z.), W. W. Forsyth (B., P., C.), R. S. France (B., P.), R. J. L. Fraser (B., P.), G. K. Fulton (B., Z., C.), *J. B. D. Galbraith (B., P.), K. J. A. Gillanders (C.), C. N. Gordon (B.), W. H. Gordon, M.A.

(B., Z., P.), W. L. Gordon (B., Z.), G. O. Grant (B., P., C.), W. R. D. Hamilton (B., P.), A. Harper (P., C.), W. E. Haydon (C.), J. C. Hendrie (C.), J. Hill (B., P.), J. Hislop (B., P.), H. F. Hollis (Z., C.), H. J. Hollis (B., P.), J. R. R. Holms (B., P.), D. W. Humble (B., Z.), E. P. Irving (B., P.), J. N. Jamieson (B.), J. A. Jenkins (B.), J. Joels (B., P.), R. E. Kerr (B., P.), W. M. Kerr (Z.), J. P. Kilty (B., P.), *A. B. M. Lang, M.A. (B., Z.), *J. R. Learmonth (B., P.), C. U. Lee (B., P.), J. E. W. Lee (B.), J. Liddell (Z.), A. E. Lillicrap (B., P.), F. R. Lubovius (B., Z., P., C.), A. J. Macartney (B., B.), A. B. Macdonald (B., P.), E. Macfarlane (Z., C.), R. F. M'Gibbon (B.), T. M'Gowan (B., P.), E. M'Guire (B., P.), J. W. Mackay (B., P.), N. Mackillop (Z., C.), D. J. M'Kinnon (B., P.), W. S. L. M'Leish (B., P.), P. M'Luskie (Z., C.), D. Macqueen (B., P.), *W. M'William (C.), *J. Marshall (B., P.), J. S. Martin (B., P.), A. M'C. Millar (C.), A. S. Miller (B., P.), G. A. Mitchell (B., Z., P., C.), L. Mitchell (C.), J. Moffat (B., P.), *J. R. J. Myiles (B., P.), D. J. Nicol (B., P.), W. Nicolson (B., P.), J. B. O'Neill (Z.), W. H. Palmer (C.), F. F. Paul (B.), *N. B. Peacock (B., C.), G. Pearson (Z., C.), B. T. Pelham (B., P.), C. K. T. Pelham (B., P.), A. G. Petrie (B., P.), J. Prentice (Z.), J. Pyle (B., Z., P., C.), R. S. Reid (Z.), J. G. Rennie (B., C.), S. M. Riddick (C.), H. Robertson (B.), I. M. Robertson (Z., C.), J. L. Rowlands (B., P.), W. Scotland (B., P., C.), J. Shaw (P., C.), J. H. Shearer (B., P.), J. Smart (B., C.), E. E. M. Steen (B., P.), J. S. Stewart (Z., C.), T. S. Stirling (Z.), H. A. Summers (B., P.), D. F. Suttie (B., P.), A. S. van Coller (B., P.), A. R. Waddell (B., Z.), W. A. Walker (B., P.), W. H. Wallace (B., P.), J. Watt (B., P.), J. P. White (B., P.), J. D. Williamson (B., Z., P., C.), W. Wiseman (B., P.), G. Young (B., P.), *J. S. Young (B., P.), W. Young (B., P.). Annetta G. T Anderson (B., P.), Mabel N. Blake (Z., C.), Grace Chatterton (B., P.), Jean M. Frew (B., P.), Mary B. Gillespie (Z., C.), Alison M. Hunter (B., P., C.), *Grace L. Hunter (B., P.), Mary R. Knight (B., P., C.), Agnes P. M'Gavin (B., P., C.), Margaret T. M'George (B., P.), Elizabeth C. M'Haffie, M.A. (B.), Jessie B. Maclachlan (B., P.), Mercedes M. Morton (P., C.), Kathleen Nicol (P.), Vida J. Perry (B., Z., C.), Jessie N. Robertson (B., P.), Margaret N. Robertson (B.), Agnes P. Routledge (B.), Katherine Scott (P.), Dorothea H. Suttie (B.), Lydia I. H. Torrance (B., P.), Marion Watson (Z., P., C.).

SECOND AND THIRD M.B.† (A. Anatomy; P., Physiology; M., Materia Medica and Therapeutics).—R. Aitken (M.), W. D. Allan (A., P.), W. Baird (A., P.), J. E. Bannen (A., P.), W. Barras (A., P.), T. Blackwood (A., P.) J. P. Broom (A., P.), A. C. Brown (A., P.), H. D. Brown (A., P.), D. C. Buchanan (A.), J. A. Buchanan (A., P.) *S. E. A. Buckley (A., P.), D. R. C. Cameron (M.), D. Cameron (P.), *D. Campbell (A., P.), D. S. Campbell (M.), W. Campbell (A., P., M.), J. Chalmers (A., P.), *D. Clyde (A., P.), D. H. Coats (A., P.), W. Combe (M.), J. Connal (M.), W. K. Connell (A., P.), A. S. Cook (A., P.), W. G. Cook A., P.), R. S. Crawford (A., M.), J. Crerar (A., P.), H. P. Crow (M.) J. N. Cruickshank (A., P.) J. F. Cunningham (P., M.), R. Cunningham (A., P.), A. Davidson (P.), R. S. Dickie (A., P.), W. Donald (A.), *J. Dunbar (A., P.), E. M'M Dunlop (M.), S. N. Dykes (A., P.), J. Ewing (A., P.), B. W. H. Fergus (A., P.), L. L. Fotheringham (A., P.), M. M. Frew (A., P.), T. R. Fulton (P.), D. G. Gardiner (A., P., M.), R. S. Gibson (M.), N. W. Gilchrist (A., P.), R. K. H. Gillespie (M.), J. G. Gilmour (P.), J. Glaister (A., M.), W. Gordon (M.), T. Gray (A., P.), D. Heard (P.), S. J. Henderson (A., P.), W. A. Higgins, M.A. (M.), T. P. Hutchison (P., M.), S. Johnstone (A., P.), *A. Kennedy (A., P.), G. Kirkhope (M.), R. M. Lang (M.), J. A. Leiper (M.), R. Lindsay (A., P.), A. T. Logan (M.), P. Y. Lyle (M.), R. Lyon (A., M.), H. L. M'Cormick (A.), H. D. M'Crossan (M.), D. J. MacDougall (A.), D. K. MacDougall (A., P., M.), J. W. Macfarlane (A., P.), *J. E. Macfie (M.), G. J. M'Gorty (P.), J. P. M'Greehin (P., M.), J. MacInnes (A., P.), D. B. M'Intosh (P.), R. H. M'Killop (P.), *J. MacA. Mackintosh (A., P.), K. S. Macky (A., P.), J. W. Maclean (A., P.), *A. F. M'Millan (A., P.), D. M. Macmillan (M.), D. M'Neill (M.), E. J. MacPhail (A.), F. R. Martin (A., P.), W. Martin (A., M.), P. O. Moffat (A.), A. Morton (A., P.), J. H. Murray (A., P., M.), W. J. Poole (P.), *J. K. Rennie (M.), J. Richardson (A., M.), A. W. Ritchie (A., P.), D. B. Robertson (A., P.), R. Rodger (A., P.), F. W. Sandeman (A., P.), A. M'A. Scott (P.), J. Steel (A., P.), J. Steele (A., P.), *A. Stenhouse (M.), D. S. Stevenson (A., P., M.), W. M. Stewart (A., P.), G. C. Swanson (A., P.), J. B. Sweet (P.), R. T. Todd (M.), J. L. Torley (M.), H. W. Torrance (A., P.), A. J. van der Spuy (P.), G. T. Walker A., P.), J. D. Watson (A., P.), W. J. C. Watt (A., P.), R. H. Williamson (A., P.), K. J. T. Wilson (A., P.), R. J. Wilson (A., M.), W. L. Wilson (M.). Christina B. Buchanan (A., P.), *Maud C. Cairney (A., P.), Ann K. Cormack (P., M.), Winnifred J. Crawford (A., P.), Jane B. Davidson (P.), Jessie C. Gilchrist (A., P.), Jean L. Hamilton (P.), Janet D. F. Henderson (M.), Helen I. W. Kerr (A., P.), Florence S. Kirk (P.), May C. B. Leigh (P.), Dorothy M'Cubbin (P.), Margaret J. Maclachlan (A., M.), Mary A. M. MacLean (A., P.), Ettie C. M'Vie (P., M.), Elizabeth S. Martin (A., P.), Margaret K. Mitchell (A., P.), Janey L. Munro (A., P.), *Helen Y. Murdoch (A., P.), Mary A. Noble (A., M.), Mary H. Routledge (A., P.), Mary Scott (P., Mary I. Sinclair (M.), *Jane Stalker (A., P.), Margaret A. H. Stewart (M.), Isabel S. Thomson (M.), Alison E. Wilson (A., P.). Marion B. D. Wilson (A., P.), Mary F. Wood (A., M.).

THIRD AND FOURTH M.B.† (P., Pathology; M., Medical Jurisprudence and Public Health).—G. K. Allan (M.), J. M. Anderson (M.), J. Anderson (P), A. D. Blakely (M.), W. E. Boyd (M.), J. Buchanan (M.), W. E. A. Buchanan (M.), J. Cameron (P., M.), J. Campbell (P., M.), J. M. Campbell (P.), A. M. Clark (P.), A. La B. Clark (P., M.), R. Clark (M.), W. Cullen (P.), F. V. Daeblitz (P.), T. Ferguson (P.), H. T Findlay (P.), G. J. Fraser (P., M.), I. M. Fraser (P., M.), W. W. Galbraith (M.), T. Gilchrist (M.), G. Gordon (M.), *R. T. Grant (P.), R. M. Lang (P.), W. J. B. Lavery (P.), H. D. M'Crossan (P.), *A. M. M'Cutcheon (P., M.), D. F. Macdonald (P.), *J. B. M'Dougall (P., M.), D. M. M'Intyre (M.), M. B. Macleod (P.), F. W. M'Millan (P., M.), J. K. Manson (M.), J. M. Matheson (M.), J. P. Mathie (M.), T. S. Meighan (M.), P. Naith (M., J. M. Pinkerton (M.), J. S. Prentice (P., M.), W. B. Primrose (P.), H. Quigley (M.), T. F. B. Reid (M.), G. W. Ronaldson (M.), A. F. Ross (M.), A. M. Russell (M.), S. C. Shanks (P.), J. Sillars (M.), J. Smith (M.), N. M. Smith (M.), J. B. Steven (M.), J. F. Steven (P.), R. S. Strachan (P.), C. R. T. Thompson (P., M.), W. Thomson (M.), J. Walker (P., M.), J. G. Wilson (P., M.), A. Young (M.). Agnes E. M. Cooke (M.), Dagmar F. Curjel (M.), Ethel W. Gompertz (M.), M. Walker (P.), Marguerite Wilson (M.), Isabella H. Younger (P.)

FINAL.—*D. K. Adams, Norah M. A. Allan, E. A. C. Beard, S. H. Bloom, W. A. Brechin, D. P. Brown, Margaret J. Brown, B. Cohen, *W. M. Conley, N. Crichlow, L. Crombie, D. A. Cush, G. D. de Kock, J. Dunbar, W. C. Fleischmann, W. Forsyth, W. Fotheringham, I. D. Grant, J. G. Hendry, *W. J. Henry, G. Hislop, *Mary P. Hislop, *W. Hornsby, A. Lindsay, *D. M'Alpine, J. L. M'Bean, J. A. M'Connochie, *J. W. M. M'Donald, J. MacInnes, Annie R. M'Kail, D. Mackinnon, J. R. C. Mackintosh, *R. M'Lean, A. P. Martin, O. H. Mavor, A. U. Millar, M. Murphy, A. Naismith, T. M. Newton, J. Purdie, A. M. Ramsay, D. Smith, W. R. Snodgrass, W. R. Taylor, *C. J. van Lingen, R. B. Wallace, *M. White.

* Passed with distinction in one or more subjects.
† Under old and new regulations.

The following were degrees conferred by the Vice-Chancellor on October 9th:

M.B., CH.B.—*D. K. Adams, †W. J. Henry, †W. M. Conley, †T. M. Newton, †J. MacInnes, Nora M. A. Allan, E. A. C. Beard, S. H. Bennet, W. A. Brechin, D. P. Brown, Margaret J. Brown, B. Cohen, N. Crichlow, L. Crombie, D. A. Cush, G. D. de Kock, J. Dunbar, W. C. Fleishmann, W. Forsyth, W. Fotheringham, I. D. Grant, J. G. Hendry, G. Hislop, Mary P. Hislop, W. Hornsby, A. Lindsay, D. M'Alpine, J. L. M'Bean, J. A. M'Connochie, J. W. M'Donald, Annie R. M'Kail, D. Mackinnon, J. R. C. Mackintosh, R. M'Lean, A. P. Martin, O. H. Mavor, A. U. Millar, M. Murphy, A. N. J. Purdie, A. M. Ramsay, D. Smith, W. R. Snodgrass, W. R. Taylor, C. J. van Lingen, R. B. Wallace, M. White.

B.SC. (*Public Health*).—Tehl Singh.

* With honours. † With commendation.

The Brunton Memorial Prize (value £10) for the most distinguished medical graduate of the year has been awarded to Mr. John S. K. Boyd.

UNIVERSITY OF ST. ANDREWS.

THE following candidates have been approved at the examination indicated:

FIRST M.B. (*Zoology*).—J. P. Leckie, Margaret W. Shirlaw.

UNIVERSITY OF LONDON.

THE UNIVERSITY BUILDINGS.

AT the meeting of Convocation on October 14th the two following resolutions were adopted:

That whenever arrangements are made in connexion with a new site for the University they should expressly provide that the Government shall continue to provide accommodation for the University free from expense for rent, rates, taxes, and structural repairs, as it has done since the foundation of the University.

That inasmuch as the accommodation for university purposes at South Kensington is neither adequate nor suitable, the Senate be requested to promote negotiations for a fitting site.

The second resolution, as originally moved and carried by a large majority as an amendment to another motion, contained the phrase "a new site," and the substitution of "fitting" for "new" was carried by 60 votes to 59.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

A QUARTERLY council was held on October 9th, Sir Rickman J. Godlee, Bart., President, in the chair.

Donations.

Dr. Keatinge, Director of the Egyptian School of Medicine at Cairo, was asked to convey the thanks of the Council to the Egyptian Government for presenting to the College a series of "corrosion preparations" made by Professor Wahby and recently exhibited in the museum of the Seventeenth International Medical Congress.

The gratitude of the Council to the authorities of the Egyptian Exploration Fund for their presentation of twenty-four skulls discovered during excavations in Egypt last winter was also recorded.

The thanks of the Council were given to the Director of the Department of Agriculture at Washington, U.S.A., for presenting to the College a collection of plants and drawings made by Dr. Erwin E. Smith to illustrate tumour formation, and recently exhibited in the museum of the Seventeenth International Medical Congress.

Thanks were also given to Sir Thomas Wrightson, Bart., for his gift of a Leitz projection apparatus and a serial section of the human labyrinth.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

THE Liston Victoria Jubilee Prize (value £100) has been awarded to Mr. John David Malcolm for his investigation into the causes of shock.

CONJOINT BOARD IN ENGLAND.

THE following candidates have been approved at the examination indicated:

FIRST COLLEGE (*Part IV, Practical Pharmacy*).—E. G. Anderson, W. Andrew, C. S. Archer, C. J. L. Blair, P. R. Chevreau, A. M. Clément, G. R. E. Colquhoun, A. J. Drew, A. P. Green, J. A. Gregory, Dorothy M. Henty, J. A. Hill, J. Hope, F. B. Jago, G. L. Lawlor, J. MacAdam, W. F. Matthews, W. Morris, C. F. Pedley, A. Peine, H. L. Peregrine, P. H. Rawson, A. St. Johnston, H. C. Samuel, A. E. Schokman, A.-el-K. Selim, J. W. G. Steell, E. L. Stephenson, D. Stewart, G. A. O. White, S. M. Wilcox.

CONJOINT BOARD IN SCOTLAND.

THE following candidates have been approved at the examination indicated:

D.P.H. (*Both Parts*).—A. D. Campbell, G. R. Vohra, C. Cameron, W. A. Muir, N. R. R. Ubhaya, A. Campbell, G. G. Jolly, W. S. M'Laren, J. D. Saner, M. L. Bangara, G. Richardson, A. G. Ingram, J. A. MacLeod.

KING'S COLLEGE HOSPITAL.

The authorities of the medical school have made the following awards of entrance scholarships: The scholarship in science, for students commencing their medical studies, to Mr. H. O. Gunewardene; the scholarship in arts, for students of the same standing, to Mr. A. Blackstock; the scholarship in general and clinical pathology and pharmacology, for students commencing their final medical studies, to Mr. E. C. Malden. The corresponding scholarship in anatomy and physiology was divided between Mr. W. Wood and Mr. H. A. B. Whitlocke. All these scholarships are of the value of £50 each.

LONDON HOSPITAL.

The name of the candidate to whom has been awarded the *Price Scholarship in Science* is C. S. Cloake, not C. S. Clarke, as printed in our issue for October 4th.

Medical News.

The autumn dinner of the Irish Medical Schools' and Graduates' Association will take place at the Hotel Cecil, Strand, W.C., on Thursday, October 30th.

Dr. Norman Porritt, Honorary Treasurer of the Society of Medical Phonographers, has forwarded on behalf of that society a cheque for £7 7s. towards the funds of the Royal Medical Benevolent Fund.

The annual meeting of Fellows and Members of the Royal College of Surgeons of England will be held at the College, Lincoln's Inn Fields, W.C., on November 20th, at 3 p.m.

The demonstration which was to have been given by Dr. Noguchi at the Royal Society of Medicine on October 13th was, owing to his indisposition, unavoidably postponed until Monday next, October 20th, at 5.30 p.m.

The North London Medical and Chirurgical Society held its first meeting for the new session on October 9th, when an address on the mental diseases of old age was delivered by Sir George Savage. The President of the society, Dr. T. Wilson Parry, was in the chair.

An address on clinical psychiatry will be delivered by Dr. T. B. Hyslop at the opening meeting of the Chelsea Clinical Society at 8.30 p.m. next Tuesday. As last year, the society will hold its meetings in the club-room of the medical school of St. George's Hospital.

An address will be delivered in the Post-Graduate College, West London Hospital, on Thursday, October 30th, by Sir Gilbert Parker, M.P. Sir Alfred Pearce Gould, K.C.V.O., Dean of the Medical Faculty of the University of London, will take the chair at 5 p.m.

Dr. Francis Warner will commence a course of lectures at the London Hospital Medical College on the neuroses and psychoses of children on Tuesday next, at 2 p.m. The syllabus of the lectures, which will be continued on the following Tuesdays, will be found in the advertisement columns.

The next meeting of the Hunterian Society will be held in the library of St. Bartholomew's Hospital at 9 p.m. on Wednesday, October 22nd. The President of the society, Dr. W. M. Ettles, will give an address, and this will be followed by a pathological demonstration by Dr. A. S. Woodwark. All members of the profession are cordially invited to attend.

The Balneological and Climatological Section of the Royal Society of Medicine will hold its annual dinner at the Waldorf Hotel at 7.15 p.m. on October 23rd. It will follow a meeting of the Section at the society's house, at which Dr. F. A. de T. Mouillot will deliver a presidential address descriptive of lessons derived from twenty years' experience of spa practice.

A course of Gresham lectures to be given by Dr. F. M. Sandwith, Gresham Professor of Physic, on Tuesday, Wednesday, and Thursday, October 28th, 29th, and 30th, at 6 p.m., will deal with Harvey, Darwin, and Huxley respectively. On October 31st Dr. Sandwith will give a lantern demonstration bearing upon the subject of the lectures and will show some letters and other interesting relics.

The opening address of the winter session of the North-East London Post-graduate College will be delivered at the Prince of Wales's Hospital, Tottenham, on Thursday, October 23rd, at 4.30 p.m., by Sir Arbuthnot Lane, Bart., the subject being Chronic Intestinal Stasis. Dr. W. Seaman Bainbridge (New York) and Dr. A. C. Jordan will show slides, and some twenty patients, who have undergone the operation devised by Sir Arbuthnot Lane, have agreed to attend. Tickets of admission to the meeting can be obtained by any medical practitioner on application to the Dean of the College, 142, Harley Street.

Some clinical observations on the employment of salvarsan in syphilitic pregnant women have been recorded by Dr. Sauvage, obstetrician to the Paris Hospitals. He admits that injection of salvarsan is not without danger to the life of the fetus, but considers that the risk is not high, and the influence of the drug, when it has become diffused over the mother's system, is decidedly favourable to the offspring. Dr. Sauvage adds that, though the standard signs of syphilitic taint are rare in the newborn child of a mother under this treatment he has seen malformations and general dystrophy, resembling those produced by syphilitic infection. Sauvage concludes that injections of salvarsan produce a decidedly favourable effect on syphilitic complications in active progress in gravid patients, but states that in actual practice the use of salvarsan in pregnancy involves risks so serious as to demand precise indications. When syphilitic infection is active, manifesting itself in the usual symptoms and in special complications incident to gestation, the treatment appears altogether good, and is favourable not only to the mother but likewise to the fetus. Syphilis, evidently in existence but not active, may indicate the advisability of salvarsan treatment if there be a distinct history of imperfect or neglected specific treatment before conception. On the other hand, when a syphilitic subject has been kept under suitable treatment for a long period before her pregnancy, and shows no complications during gestation, mercurial or mixed treatment is indicated, as salvarsan injections involve more risk. Women with renal and hepatic disease are unfitted to undergo salvarsan treatment.

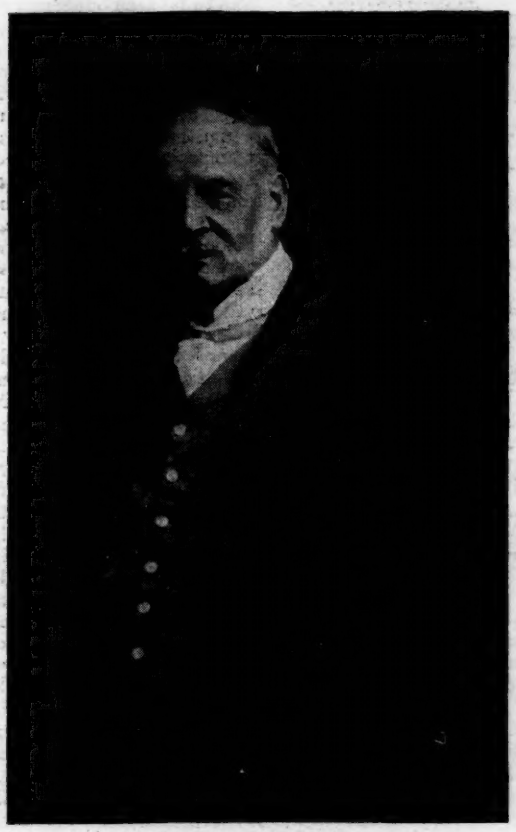
An instance of a woman afflicted with acromegaly becoming pregnant is now under observation at Budapest (Dr. Lados Kalledey, *Zentralbl. f. Gynak.*, No. 28, p. 1030). The catamenial function was suspended when the symptoms of acromegaly developed, yet when ovarian extract was administered it returned and impregnation occurred. The patient was 32 years old, and married twelve years. There was no family history of importance, and she had enjoyed good health in youth. The periods began at 17, and were scanty, with little pain. At about the age of 20 her gait became unsteady; at the same time her feet steadily increased in size, and she was troubled with vertigo, headache, palpitations, and insomnia. At the age of 22 complete amenorrhoea set in, and she began to grow fat. She was, when first examined last autumn, 5 ft. 1½ in. in height, and of masculine appearance; indeed she was obliged to shave, as she had acquired a well-developed beard. The long bones were very big, the lips and nose thick, the subcutaneous fat universally over-developed, and the mammae large, mainly through a disproportionate growth of adipose tissue. No organic disease of the heart or lungs could be detected, but the patient had an attack of syncope during examination; Romberg's sign was marked, and the gait was ataxic. The *x* rays failed to detect any abnormality in the base of the skull. The urine was free from sugar; the cervix was conical, but the uterus could not be well defined owing to the fatness of the abdominal wall. Dr. Kalledey diagnosed diminished ovarian and excessive hypophysial function, and early in December, 1912, began intravenous injections of a watery extract of ovarian substance, a cubic centimetre representing a gram of (cow's) ovarian tissue. After six injections at intervals of three weeks the gait improved, and headache and vertigo diminished. When she left the Budapest Gynaecological Clinique on January 6th, 1913, Dr. Kalledey prescribed three ovarian tabloids daily. On January 22nd molimen was felt, and a few drops of blood appeared. On February 2nd free uterine haemorrhage developed, and the patient declared that she was obliged to wear smaller shoes and to alter the fit of her clothes, which had grown too wide for her. On March 2nd and 5th Kalledey administered 1 c.cm. by the veins, but treatment was suspended for a fortnight owing to what her family doctor diagnosed as influenza. On March 30th, the catamenia having failed to appear, the patient was examined. Signs of early pregnancy were detected, and the ovarian extract was discontinued. On April 30th all the signs of pregnancy in the second month were found, and a month later, when the report was prepared, gestation was proceeding normally.

Obituary.

SIR JOHN BATTY TUKE, M.D.Edin., F.R.C.P.E., LL.D.Edin., D.Sc.(Hon. Causa)Dub., F.R.S.E., etc.

Sir John Batty Tuke, who died at his residence, Balgreen, Gorgie, near Edinburgh, on Monday, October 13th, although associated with Scotland, and particularly with its capital, for nearly his whole life, was a Yorkshireman by birth and a native of Beverley. He exhibited, too, in his life some of the best of the characteristics of the Yorkshireman: he had tenacity of purpose, pluck, grit, and strength of mind, with a sound judgement; his words were always weighty and his opinions to be respected; and he marched steadily on through varying circumstances, remembering, perhaps, that "the Yorkshireman's days are of all sorts and sizes."

Sir John was born in Beverley on January 9th, 1835, and was the eldest son of John Batty Tuke, of that quiet town with the two big churches; his boyhood and youth he, however, spent in Edinburgh—first at school at the Academy and later as a student of medicine in the University. He graduated M.D. in 1856, and married in the same year Lydia Jane Magee, youngest daughter of the Rev. John Magee, Rector of Drogheda, and sister of W. C. Magee, the eloquent Bishop of Peterborough, who was translated to York shortly before his death.



Sir John Batty Tuke.
(Photograph by Elliott and Fry, Ltd.)

Immediately after his graduation and marriage John Batty Tuke proceeded to New Zealand, where he acted as surgeon to the Colonial troops, and served as senior medical officer in the Maori war from 1860 till nearly the end of the campaign in 1863. He then returned to this country to find his life-work in the department of medicine which deals with the treatment of the insane, a sphere in which earlier Tukes had borne an honourable part; but he had an opportunity in later years of revisiting the battlefields of the Maori war. He began, as many other distinguished alienists have done, as assistant physician at the Royal Edinburgh Asylum; then he acted as medical superintendent of the Fife and Kinross Lunatic Asylum from 1865 to 1873, and did much there to introduce and establish the "open door system" of management. He then returned to Edinburgh, where, along with Drs. Smith and Lowe, he took charge of Saughtonhall Asylum, a large institution for the treatment of the insane, which was then situated to the west of Edinburgh, but has since been removed to the south of the city, to Mavisbank, Polton, under the name of New Saughton Hall. For many years Saughton Hall was under Sir John's sole control, but he was also in practice in Edinburgh as a specialist in mental diseases, and played a leading part in many other spheres of medical interest. Lately he associated his son, Dr. John Batty Tuke, with himself in his asylum work, and became director of New Saughton Hall and visiting physician thereto.

Soon after his return to Edinburgh (in 1874) he was appointed Morison Lecturer in the Royal College of Physicians, to which he had been admitted a Fellow in 1871; exactly twenty years later he again held the Lectureship, and chose as his subject "The Insanity of Over-exertion of the Brain," and many of those who attended remember his huge wall diagram of the cerebrum—surely the biggest of its kind. He also became a Lecturer on Insanity in the Extramural Medical School (1899) and in the Medical College for Women. He was closely attached to the Royal College of Physicians, representing that body on the General Medical Council for twenty-five years (1887–1912); played a great part in the establishment (1887) and development of the Laboratory for Research of the College, and served for ten years as a manager of the Edinburgh Royal Infirmary. If any part of his work should be selected for special praise, it should be the labour which he so ungrudgingly bestowed upon the laboratory; and it must have been a keen satisfaction to Sir John to see in the post of superintendent to that institution three such men as Professor Sims Woodhead, Professor Noel Paton, and now Professor James Ritchie.

It was but natural that he should be elected President of the College, and it was during his occupancy of the presidential chair that he received the honour of knighthood (1898); but before this (in 1896) he had been made D.Sc. (*honoris causâ*) of Trinity College, University of Dublin, and later his own university (in 1902), inscribed his name as an Honorary Graduate in Law (LL.D.). He had served the university well in Parliament, having been elected member for the dual constituency of Edinburgh and St. Andrews in 1900 as a Unionist, succeeding the late Sir William Priestley. After his election he spent much of his time in London during the parliamentary sessions. He never sought to obtain a prominent position as a party politician, but his frankness, geniality, and wide knowledge of his own subject won the respect of his fellow-members and gave him an influence out of proportion to the part which he took in the public proceedings in the House of Commons. Failing health reconciled him to retiring from a parliamentary career, and in 1910 he made way for Sir Robert Finlay. For the past few years Sir John Batty Tuke lived mostly in retirement, his old enemy, the gout, hampering him a good deal, and ultimately bringing his life to an end on October 13th.

He was a Fellow of the Royal Society of Edinburgh; he had been President of the Medico-Chirurgical Society of Edinburgh, and for many years served as a director of the Royal Maternity Hospital, Edinburgh. He made a number of important contributions to the study of insanity, and, in addition to publishing his two courses of Morison Lectures, he wrote the articles on "Hysteria," "Insanity," etc., for the *Encyclopaedia Britannica* (ninth edition), and published papers on insanity of pregnancy, puerperal insanity, and insanity of lactation, etc.

He was a member of the British Medical Association for many years; he was President of the Section of Psychology at the annual meeting in London in 1895, and at the annual meeting in Edinburgh three years later gave the Address in Psychology. In this address he discussed modern conceptions of the etiology of insanities, and it may be taken as containing his confession of faith as to the scope and future of the speciality to which he had devoted his life. It was characteristic of his temperament and conviction that after thirty-five years' study of the nature and treatment of mental diseases he was able to take a sanguine view of what scientific investigation could do for their elucidation, and that he even then believed that a nosology of mental

diseases founded on morbid anatomy was near at hand. To the realization of this hope he devoted time and energy. He was always anxious to encourage workers in this field of investigation, and ever ready to use his influence to secure for them adequate facilities for the prosecution of such researches. In this same address he insisted on the importance of the special treatment of cases of recent insanity. He urged that they should not be mixed up with the residual and chronic cases, but placed in a separate institution where they could be submitted to systematic treatment on thoroughly hospital principles. The importance of this reform has been generally admitted and greatly extended since he spoke. The wide range of his sympathies in all matters attaching to the functions of the nervous system was shown by his election to be president of the Neurological Society of the United Kingdom.

We have said above that Sir John Batty Tuke showed many of the best characteristics of the Yorkshireman, but we omitted to mention one which endeared him to many of his friends during holiday time. We mean, of course, his love of sport, which was catholic in extent, and included golf as well as shooting and fishing. Although his face has been much less seen on the Edinburgh streets in recent years, there will be many in the profession and out of it who will miss his smile of recognition and somewhat quizzical look of regard.

He is survived by his widow, three sons, and a daughter.

JAMES WILLIAMS, M.R.C.S., L.S.A.,

HOLYWELL, FLINTSHIRE; FORMERLY PRESIDENT OF THE NORTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION.

To the general regret there passed away at Holywell, in Flintshire, on September 19th, Dr. James Williams, whose general position in the public esteem is almost sufficiently indicated by a quotation of the term which was often affectionately applied to him—namely, the Grand Old Man of Holywell. He was born in that town in the early years of the third decade of last century, and commenced his medical studies as a pupil of his father, himself a well-known personality in that neighbourhood, and continued them at the Royal Infirmary, Liverpool, and St. Bartholomew's Hospital, London. He became M.R.C.S. in 1848 and L.S.A. in 1849, and served for a time as resident surgeon at Warrington Infirmary, where he played a conspicuous part in connexion with a cholera outbreak. He afterwards joined his father at Holywell, and again had to deal with an outbreak of cholera. His history from that time onward is the history of Holywell itself, for he served it practically for the rest of his life, not only as a medical man, but also as one of its leading citizens. Professional work he gave up some ten years ago, but he remained a member of its urban district council, of which he was the first chairman, and as recently as last year made a short speech at a public meeting in connexion with an antituberculosis exhibition.

During his long career he filled a good many professional offices, and some of them for a remarkably long period. He was, for instance, M.O.H. for the district for thirty-seven years, and public vaccinator for as many as fifty-six. He was a great believer in the truth of the saying, *Salus populi suprema lex*, and his annual health reports bore constant testimony both to this feeling and to his capacity for lucid expression. Modern views on the subject of tuberculosis were no surprise to him, for he used to relate that his father was accustomed to prophesy that the day would come when the current belief that consumption was an hereditary disorder would cease to obtain credence. But, in any case, Dr. Williams would have been prepared to accept the modern view, for he had kept himself in touch with the progress of science throughout his active career, and up to the end of his life exhibited a receptivity of mind quite rare in a man of his advanced age. Until he gave up professional work he had a large family practice, and the soundness of his judgement as a clinical physician was acknowledged not only by his patients but by his professional colleagues over a wide area in North Wales. Among the latter he obtained an excellent reputation quite early in his career, with the result that he was elected by them President of the North Wales Branch of the British Medical Association as far back as 1868. In his public work he was greatly assisted by the facility he possessed for expressing himself clearly and a certain skill in reconciling the views of conflicting parties.

On the day of his funeral flags were flown half-mast high on all places of public worship in the neighbourhood, and his funeral was attended by a large concourse. Dr. Williams married a niece of his old St. Bartholomew's teacher Frederick Skey, one of Abernethy's more famous pupils. She died some twelve years ago. He is survived by two sons and three daughters, one of the former having succeeded him in his practice at Holywell.

JOHN MACMILLAN, M.A., M.B., C.M., D.Sc., F.R.C.P.E., F.R.C.S.E.,

EDINBURGH.

JOHN MACMILLAN died at his house, 22, George Square, Edinburgh, on Tuesday, October 7th. He underwent a somewhat serious operation about two years ago, and his many friends in the profession and outside of it were delighted when he made a good recovery therefrom, and was to be seen once more in college and lecture room, at examination meetings, and on the streets of the city, where his strikingly tall and slim figure always attracted attention. The end, however, was not far off, and he passed away, almost without his acquaintances knowing that he was again laid aside, on October 7th, when the medical classes were opening, and the students who were always so dear to his heart were reassembling. It was at a somewhat more advanced age than is common that Dr. Macmillan turned to the medical profession. He was an M.A. of St. Andrews, and a B.Sc. in Natural Science of Edinburgh University in 1879; he spent some years first at Perth Academy, and later in the Academy of Edinburgh engaged in teaching mathematics and science, and there are not a few members of the medical profession living in Edinburgh now who were his pupils in one or other of these two academies. He imbued many a lad and young man with a true love of botany and the natural sciences. He graduated M.B., C.M.Edin. in 1892, B.Sc. in Public Health in the same university in the following year, and D.Sc. in 1894. He was elected a Member of the Royal College of Physicians in 1895, and a Fellow of the same College in 1896; and some years later (1903) he was also elected a Fellow of the sister College (of Surgeons). He studied abroad as well as at home, visiting the medical schools of Jena, Berlin, Vienna, and Paris. He became in 1910 a lecturer on medical jurisprudence and public health in the Edinburgh extramural school, and he was an examiner in biology for the College of Physicians and for the D.P.H. of the College of Surgeons. Dr. Macmillan was also a Fellow of the Royal Society of Edinburgh and of Edinburgh Obstetrical Society, and was President of the Scottish Natural History Society. He gave a paper on fungi in the aërial roots of epiphytic orchids to the British Association in 1885. Kindliness was perhaps the most outstanding of Dr. Macmillan's characters, and no one could be long in his company without discovering it; it was only on further acquaintance that his stores of accumulated learning were revealed. Possibly he was at his best as a teacher, and he loved science; but he was always a sympathetic and attentive practitioner of medicine, too. Dr. Macmillan was never married.

ONE of the best-known medical practitioners in the east end of Glasgow, Dr. MATTHEW MARTIN, died with startling suddenness on October 10th. He had been engaged in his usual round of visiting when he became ill about midday, and dropped in the street. He died before assistance could be given him. He had been chatting with a friend a few minutes before his sudden attack. He was a native of the east end of Glasgow, his father and his brother both having served for long periods in the town council and city magistracy. His brother, Mr. J. H. Martin, was at the time of his death the "father of the council." Dr. Martin graduated at the University of Glasgow in 1862, and since then has been in practice in the city. He was treasurer for the Poor Law Medical Association, and for thirty years served on the Glasgow Parish Council. It was expected that he would enter for municipal honours next month, a course that had long been pressed upon him. He was a most enthusiastic worker, and in addition to his

professional work had varied interests in the life of the city; he was on the executive of the local Unionist Association, and a past chairman of the Municipal Ward Committee. He leaves a widow and one son.

On October 3rd Dr. Frederick Royston Fairbank passed away, in his 73rd year, at Caversham. He was educated at Rugby School, the Manchester Royal School, and at King's College, London. He was in practice for some time at Lynton, and later for a number of years at Doncaster. Here he had a large and influential practice, was surgeon to the infirmary, and surgeon-captain in the Yorkshire Dragoons Yeomanry. In 1892, as he suffered severely from rheumatism and bronchial asthma, he removed to St. Leonards, and afterwards to Dorking; having disposed of his practice there about three and a half years ago, he retired to Caversham. He had been a Fellow of the Royal Medical and Chirurgical Society since 1869, and he was also F.R.C.P.Edin. and M.D. Heidelberg. He was a keen and accurate physician, as evidenced by a paper on digitalis in the *Transactions* of the Clinical Society; and a skilful surgeon, as was shown by the excellent results of tarsectomies he executed for relief of talipes equino-varus in adults. A clinical notebook he designed is of considerable value. In his later years he was drawn more to the study of archaeology and architecture, and was elected F.S.A.Lond. in 1888. He published several articles, particularly on brasses and memorials of Old Surrey, in the Associated Architectural Societies' Reports of excavated Roth Abbey. He was twice married, and leaves two daughters and a son with his widow to mourn his loss.

Lieutenant-Colonel John Ritchie, R.A.M.C., died suddenly in a nursing home in Glasgow, on October 6th, aged 50. After graduating M.B., C.M. in the University of Glasgow in 1884, he entered the R.A.M.C. as Surgeon on February 5th, 1887, becoming Major on February 5th, 1899, and Lieutenant-Colonel on July 29th, 1911. He was stationed last winter at Firuzpur, in the Punjab, but for the past six months had been at home on sick leave. He served in West Africa in 1898–9, in Sierra Leone, receiving a medal and clasp, and in the northern territories of the Gold Coast, getting another clasp. He also served in the South African war from 1900 to 1902; in the operations in the Orange Free State in April and May, 1900; in the Transvaal in May and June, 1900, including the actions near Johannesburg, Pretoria, and Diamond Hill on June 11th and 12th; in the Orange River Colony up to March, 1901, including the action at Wittebergen; and in the Transvaal from March, 1901, to May, 1902, gaining the Queen's medal with four clasps and the King's medal with two clasps.

Public Health.

LOCAL GOVERNMENT REPORTS.

Rochester Borough.—In August and September, 1912, there occurred in the Strood portion of the borough of Rochester a sudden outbreak of typhoid fever, in which 69 persons were attacked, of whom 8 died. An account of his investigation of the outbreak is contained in a report by Dr. S. W. Wheaton to the Local Government Board.* Rochester is divided by the river Medway into two distinct parts, the more modern, Strood, having a population of about 14,000 persons, or rather less than half of the whole borough. The earliest cases were notified during the first week in August, 1912, and in the two successive weeks there were notified 26 and 21 cases respectively. The sufferers were found to be served by eight different milk supplies, and quite half the persons attacked had condensed milk only, so that it seemed very improbable that milk was the medium of infection. There was, however, strong evidence that the outbreak was water-borne. The water supply to the houses concerned is from a well sunk through the chalk. In the neighbourhood of the well are numerous cesspools connected with water-closets, the walls of which are formed by the bare chalk and the contents of which soak away into the chalk. There were also drains which were known to be defective. In the vicinity of the waterworks, within a radius of 300 yards, there are at least fifty cesspools, the liquid contents of which soak away into the chalk. It is held that the specific infection of the water in the well was in all probability derived from a house in the Strood rural district the drainage of which ran through the waterworks site. In this house during June there was a patient suffering from typhoid fever. Dr. Wheaton states that the sources of pollution of the well are so numerous, and are increasing so much with the extension of building operations in the borough and adjoining rural area, that it will be impossible with certainty to exclude them. He gives cogent reasons for stating that the water from the Strood waterworks can no longer be considered safe for use.

* Reports to the Local Government Board on Public Health and Medical Matters. Dr. S. W. Wheaton's Report on Enteric Fever at Strood in Rochester Borough in 1912. (New Series No. 79.) London: Wyman and Sons. 4d.

The Services.

GOOD SERVICE PENSIONS IN THE INDIAN MEDICAL SERVICE.

The *Gazette of India* of September 13th, 1913, announces the grant of Good Service Pensions to several officers of the Indian Medical Service. The announcement comes somewhat late; the most recent is over two years old; the first in point of date is over eight years old; in fact, its recipient died over eight years ago. The grant of these pensions to Surgeon-Generals Bomford, Browne, Benson, and Greany was gazetted at the time, but in all four cases has been now somewhat antedated. The list is as follows:

Surgeon-General W. McConaghy (Bo.), from June 16th, 1905, vice Bookey, retired.
Surgeon-General G. Bomford (B.), from September 4th, 1905, vice McConaghy, dead.
Surgeon-General W. R. Browne (M.), from March 25th, 1907, vice Reid, retired.
Surgeon-General P. H. Benson (M.), from April 1st, 1908, vice Browne, retired.
Surgeon-General J. P. Greany (Bo.), from May 22nd, 1907, vice Fayrer, dead.
Colonel D. Wilkie (B.), from October 1st, 1908, vice Greany, retired.
Colonel H. McKay (B.), from April 2nd, 1909, vice Wilkie, retired.
Colonel R. Macrae (B.), from December 3rd, 1909, vice McKay, retired.
Surgeon-General H. W. Stevenson (Bo.), from March 1st, 1910, vice Macrae, retired.
Surgeon-General A. M. Crofts (B.), from April 7th, 1911, vice Hamilton, retired.
Surgeon-General W. B. Bannerman (M.), from July 26th, 1911, vice Benson, retired.

These pensions are bestowed, with few exceptions, only on administrative officers, and are not tenable along with the increased pensions given, in the Indian Medical Service, to officers of these ranks who complete their tour of office as such. In most cases, therefore, the recipients vacate these pensions on retirement, after having enjoyed them for, at most, a few years. The pensions amount to £100 a year, and are appreciated rather as a distinction and as an acknowledgement of good service, than for their pecuniary value. Two of the officers upon whom they have now been conferred—Surgeon-General McConaghy and Colonel Macrae—enjoyed them for less than three months.

In the rare cases in which such pensions are conferred upon officers who have not attained to administrative rank, they are tenable for life, along with the ordinary pension of rank. Brigade-Surgeon James Arnott, of the Bombay Medical Service, received one of these pensions on March 2nd, 1896. He retired as a Brigade-Surgeon. A Good Service Pension was also bestowed upon Sir Joseph Fayrer, who retired as a Surgeon-Major after he vacated the post of President of the India Office Medical Board; and he drew it till his death.

As one of these pensions was bestowed upon the present Director-General of the Indian Medical Service, Sir C. P. Lukis, from January 1st, 1910, all four of the Surgeon-Generals in that service now hold them. No other officer of the Indian Medical Service on the active list has one, and one only, Arnott, on the retired list.

A quarterly court of the Directors of the Society for Relief of Widows and Orphans of Medical Men was held on October 8th, when Sir Thomas Boor Crosby, President, in the chair, and twenty members of the court were present. Three gentlemen were elected members of the society. The sum of £523 was voted to be distributed among the widows and orphans at Christmas, each widow to receive £10, each orphan £3, and each orphan on the Copeland Fund £10. The Brickwell legacy of £37,250 recently received will yield an annual income of £1,325 10s., and it was resolved to authorize the directors to dispose of this income by increasing the grant to widows over the age of 65 by £25, and under that age by £10 a year, by increasing the grants under the Copeland Fund by £20 a year, and by an increased grant of £15 a year to orphans other than those in receipt of grants under the Copeland Fund. The invested funds of the society now stand at £139,500. Relief is only granted to the widows and orphans of deceased members. Membership is open to any registered medical practitioner who at the time of his election is resident within a radius of twenty miles of Charing Cross. The annual subscription is two guineas. Special terms for life membership. Further particulars and application forms for membership may be obtained from the Secretary at the office of the society, 11, Chandos Street, Cavendish Square, W.

Letters, Notes, and Answers.

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C., on receipt of proof.

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TELEPHONE (National):—
2631, Gerrard, EDITOR, BRITISH MEDICAL JOURNAL.
2630, Gerrard, BRITISH MEDICAL ASSOCIATION.
2634, Gerrard, MEDICAL SECRETARY.

☞ *Queries, answers, and communications relating to subjects to which special departments of the* BRITISH MEDICAL JOURNAL *are devoted will be found under their respective headings.*

QUERIES.

DR. G. ARBOUR STEPHENS (Swansea) asks for references to statistics with regard to appendicitis in this and other countries.

SALVARSAN IN PERNICIOUS ANAEMIA.

PERNICIOUS ANAEMIA asks if any one can tell him of relapse in this disease following "cure" by salvarsan, which rescued a former patient from the jaws of death with apparently a complete cure eighteen months ago, but this man cannot now be traced. The present patient is a woman of 30, with three years of debility, anaemia, and dyspepsia. For a few weeks she has had severe anaemia (haemoglobin 39 per cent.), and a typical blood picture. She is weak, with spells of obstinate vomiting. Liquor arsenicalis does her good, but as that treatment never prevents the ultimate victory of the disease, he would feel justified in subjecting her now to the risks of salvarsan treatment provided that no instance of relapse after its successful use is so far known. A prompt reply, with doses employed, might be life-saving.

*** Some information on this point is given by Dr. Byrom Bramwell in his clinical lecture on pernicious anaemia published in the BRITISH MEDICAL JOURNAL of May 24th last, p. 1093 (see Cases III, and XII, and perhaps also IX. Note also Cases VI and VII).

ANSWERS.

493.—The Government grant for successful vaccination is regarded as part of the emoluments of the public vaccinator. If A. has been in the habit of sharing with B. the usual fees for vaccination, he must also share with B. any additional grant he receives from the Government.

LETTERS, NOTES, ETC.

THE next award of the Alvarenga Prize, which is of the value of about 180 dollars, will be made by the College of Physicians of Philadelphia on July 14th, 1914. Essays in competition, which may be upon any subject in medicine, must be received by the Secretary of the College on or before May 1st, 1914. The essay must have been hitherto unpublished, must be typewritten and in the English language, or accompanied by an English translation.

A DISCLAIMER.

DR. H. D. MCCULLOCH (London) writes: My attention has been drawn to the appearance of my name in the lay press in connexion with the contradiction of the alleged discovery by Dr. Hugel, of Berlin, of the curative effects of radio-active agents in chronic deafness. I desire to say that I am not personally responsible, as the contradiction there did not emanate directly from me or my agents.

WILLIAM LANGLEY MEMORIAL FUND.

DR. J. P. FAGAN (London) writes: I would feel much obliged if through the columns of the JOURNAL you could make it known that subscriptions to the above received by my bankers, Sir Charles R. McGrigor and Co., 25, Charles Street, St. James's Square, S.W., will be transferred to the committee at Lagos, Northern Nigeria.

THE HUNTERIAN SOCIETY'S MEDAL.

WE are asked to remind competitors for the annual silver medal of the Hunterian Society that the latest date for sending in essays for the present competition is December 31st. The medal is given for the best essay by a general practitioner, embodying the results of his own observations. The competition is open to all registered general practitioners resident in Great Britain, Ireland, and the Channel Islands, whether Fellows of the Society or not. Full particulars may be obtained from the honorary secretaries, Dr. O. K. Williamson (21, Bryanston Street, W.), or Mr. E. Maynard, F.R.C.S. (55, Oxford Terrace, Hyde Park, W.).

HERPES AND VARICELLA.

DR. JOHN ORR (Edinburgh) writes: I have been interested by the letters in your columns regarding the relationship between herpes and varicella. The following two recent cases may afford grounds for reflection: (1) Male, aged 50, developed herpes of the scalp of severe character on September 2nd, 1913. His daughter, who had not wittingly been in contact with any case of varicella, showed signs of varicella a fortnight later. (2) A male, aged 45, became affected with herpes intercostalis on September 29th, 1913, and had a well-marked manifestation. On October 2nd he developed an equally well-defined varicella eruption, typical in character and distribution. These parallel cases may serve to indicate to your correspondents that the connexion between herpes and varicella is of the nature of a coincidence.

SHIP SURGEONS.

B.A., M.B. states that shipping companies are finding difficulty in obtaining the necessary medical officers for their vessels, and thinks that they have only themselves to blame. "Often," he writes, "the accommodation provided has been ill-ventilated and insanitary, and even to-day, on some big mail steamers, a room is offered to the surgeon without ventilation, and in which artificial light is always necessary. Until just recently the highest remuneration obtainable was £10 a month, when on the same ship the purser was receiving £16 or more, and the chief steward and chief cook £12 each. To-day the leading company trading to the East is paying £20 a month to its newly-appointed surgeons, and it seems likely that £25 will be reached shortly. This cannot be deemed excessive when chief officers receive £20 and over, and chief engineers £30 and over. Some companies, as a further inducement, are permitting their surgeons to charge regular fees to passengers, and hold out visions of anything over £200 a year being obtained in addition to the pay. Let me say at once that the ships on which anything like this amount can be earned are very few and far between, and are already in charge of permanent medical officers. In the last three months, on the large mail steamers, I have earned under £4.

"1. Let those applying for positions as ship surgeons hold out for at least £20 a month, and they will get it, even when the company permits fees being charged to passengers.

"2. Let them secure an undertaking in writing that their accommodation shall be 'an outside cabin with a porthole,' and thereby avoid the experience of a night in the tropics in an inside room.

"3. Let them insist that the cabin be furnished with an electric fan, for even this elementary necessity is refused by some companies unless an arrangement is previously come to."

"THE LONDON MEDICAL COMMITTEE."

MR. E. ARTHUR DORRELL, F.R.C.S., 45, Welbeck Street, London, W., honorary secretary of the London Medical Committee, which, he states, is "an entirely non-panel body," desires to draw the attention of the non-panel section of the profession in London to the efforts made by the London Medical Committee in promoting the formation of non-panel associations in the county of London. He states that three such associations are in existence, at Hampstead, Wandsworth, and Lewisham respectively, and that others are in course of formation. He invites non-panel men who desire to keep in touch with each other and prepare by combination to meet attacks upon their interests to communicate with him at the above address.

CURE BY LAUGHTER.

DR. GUSTAVE MONOD (Vichy), writes: And now for a French case. The whole family was gathered round the patient's death-bed, a young lady struggling for breath. Her mother fell on her knees and prayed: "Leave me this one, leave me this one, and take all my other children." Then was heard a man's voice from the corner of the room: "Are sons-in-law included?" So irresistibly comic in its pathos was the question that laughter exploded, and the patient's abscess burst.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

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